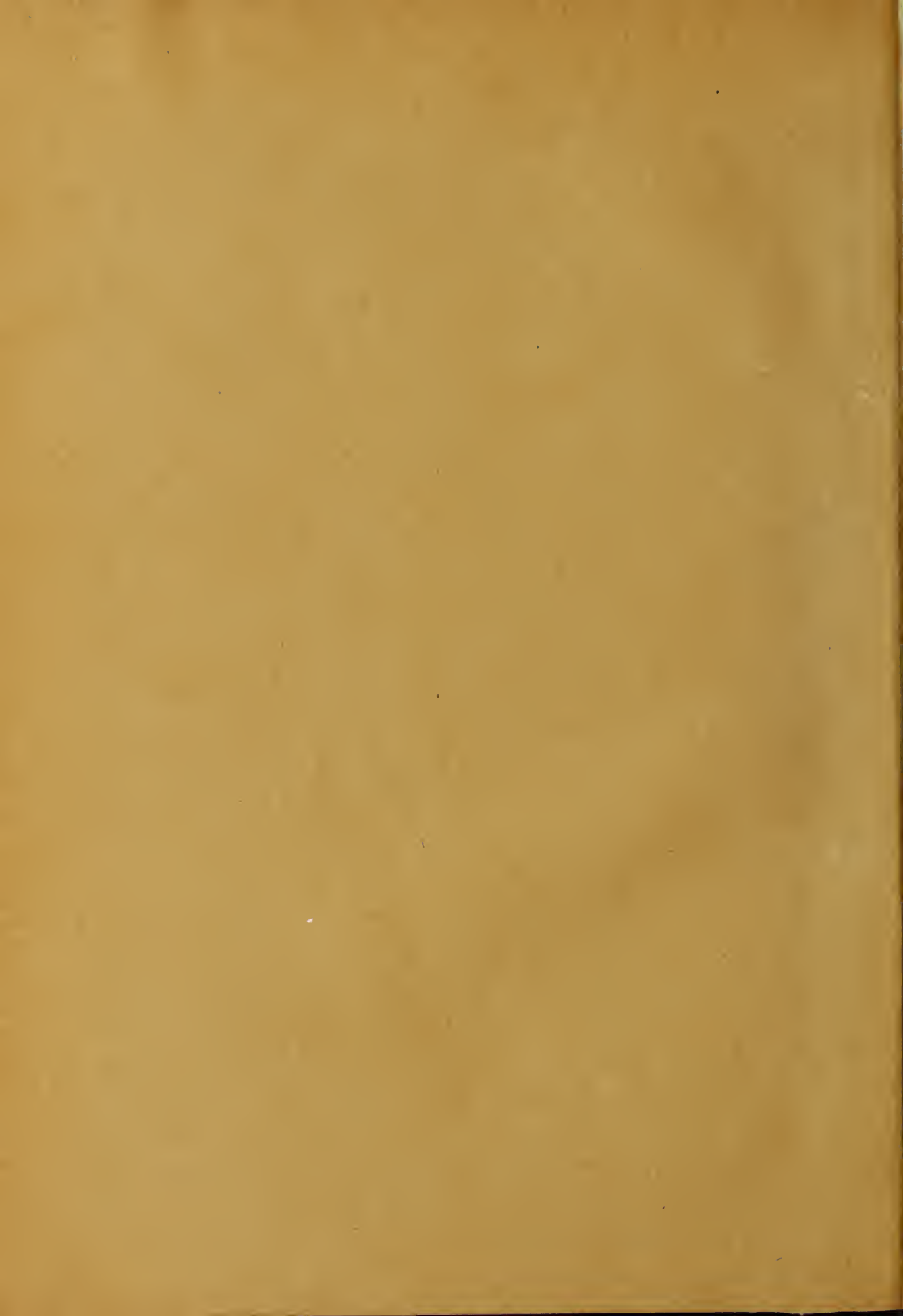


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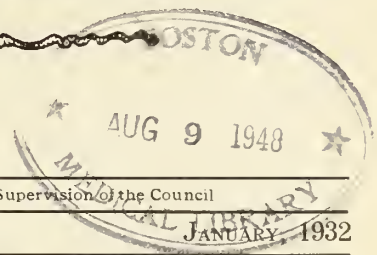
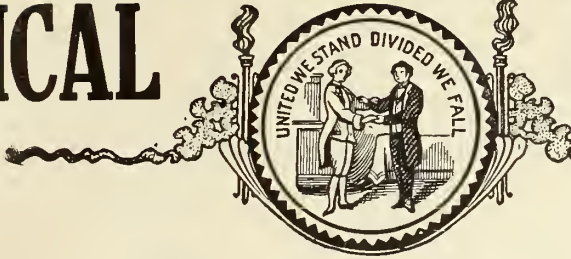








# KENTUCKY MEDICAL JOURNAL



Published Monthly by the Kentucky State Medical Association Under the Supervision of the Council

VOL. 30. No. 1

BOWLING GREEN, KY.,

## CONTENTS AND DIGEST

### EDITORIALS

- A New Year.....1  
The Woman's Auxiliary.....1  
Hygeia .....2

### SPECIAL ARTICLES

- A Doctor Looks At Medical Service in Kentucky .....2  
By Virgil Simpson, Louisville.

### OFFICIAL ANNOUNCEMENTS

- Minutes of Eleventh Annual Meeting, Eye, Ear, Nose and Throat Section.....10

### ORIGINAL ARTICLES

- Cancer of Upper Respiratory Tract.....13  
By W. P. Drake, Bowling Green.  
An Unusual General Condition With First Symptoms Appearing in the Eye.....17  
By Charles K. Beck, Louisville.  
Discussion by A. O. Pfingst.

(Continued on Page Five)

Editorial and Business Offices, 519 Tenth Street

Entered as second-class matter, Oct. 22, 1916, at the Postoffice at Bowling Green, Ky. Acceptance for mailing at special rates postage provided for in section 1103, act of October 3, 1917, authorized May 25, 1920

Subscription Price, \$5.00; Single Copy, 50 cents

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# KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. 30 No. 1

BOWLING GREEN, KY.,

JANUARY, 1932

## EDITORIALS

### A NEW YEAR

The JOURNAL extends to every physician in Kentucky its best wishes for a happy, successful new year. The JOURNAL does this with the full knowledge of the economic difficulties with which we find ourselves surrounded. Like every other profession and vocation, we are finding ourselves, each in our own local sphere, in a state of greater or less complexity or difficulty. Financial landmarks and bulwarks that had seemed permanent and impregnable have disappeared and there are changes in economic values that a few years ago would have seemed impossible. However, the principles of service upon which the medical profession rests itself are eternal. Even with the loss of income from our investments or lack of income from our services, the physician has still but one objective—that is to render service in the prevention and cure of disease. For the past two years we have found it necessary to tighten our belts, to reduce our expenditures, sometimes even to suffer, but we must maintain our courage and continue to carry on.

In Kentucky we can be proud of our record. We have definitely reduced unnecessary suffering and death from unnecessary preventable diseases. We have increased our facilities for better and more effective service to our people by the development of larger hospitals in the cities and smaller ones in the towns and villages. We have developed a public health service second to none. We have kept the faith. We must make it clear to our people that we can only continue to do this with their consent and support. They must assume a larger share in the support of the community hospitals which are essential for the successful practice of modern scientific medicine. We must make clear to them that the office expenses of the modern physician have tremendously increased and must be met if they are to have the advantage of his services. We will have no sense of despair, in a period where despair has become too universal, but we will continue to keep the faith and give the best service that can be given to our people.

### MEDICAL SERVICE IN KENTUCKY

In this issue of the JOURNAL we are printing a thoughtful consideration of the important subject of Medical Service in Kentucky by one of our most progressive members, Dr. Virgil E. Simpson. We commend its careful reading to every member in the state. It will naturally be read in conjunction with the statistical study of the subject by Dr. J. S. Chambers, of the University of Kentucky. It is particularly timely because it comes just at the beginning of a session of the General Assembly where medical matters are usually considered. It arms the profession with many facts and suggestions of great value. As individuals you may disagree with some of the suggestions, but in its principles it accords with the best considered thought of the medical profession at this time and we feel sure that the profession of the state will express the gratitude they feel to its author.

### THE WOMAN'S AUXILIARY

The development of the Woman's Auxiliary to the Kentucky State Medical Association has been slow but sure. Each year a few more of the wives, mothers, sisters, widows and daughters of the physicians of the state have become seriously interested in the possibilities of its development and their joint contributions have rendered it more and more effective. Not only in Kentucky but throughout the United States no other organization has contributed more to public health education, including the value of scientific medical service, than the women who are allied with the medical profession. A natural result of this development in such an organization has been for it to seek increasing avenues, both of self-improvement for its members and of expression for its plans, policies and methods, so that they can be of the greatest benefit to the public and to the profession.

The State Medical Journals have given as generously of their space as has been found possible. In Kentucky we have been able to give rather more than the average amount of space to the Auxiliary through the generosity of one of our members who has paid for the pages used by it.

The Auxiliary, with the approval of the House of Delegates, at the Lexington meeting, felt that the time had come for recognizing the efficiency and dignity of our Woman's Auxiliary.

an's Auxiliary by permitting them to provide themselves with a vehicle for such expression and, to this end, with this issue we begin the publication of a quarterly supplement, which will be under the full editorial control, business management and financial support of the Auxiliary. The officers of the organization have secured sufficient financial support to assure their financial independence. Of course, the supplement will be mailed to every member of the Association and we are writing this message to our members to urge them to take the supplement home so that the women of their families may know about the organization and may become affiliated with and support it. Its chief purpose will be to acquaint our women with the facts so that they may do their part in the leadership of public opinion along the constructive lines that have been approved by the State Medical Association and the American Medical Association.

Before turning the supplement over to the women, who will naturally be most interested in it, we urge our members to look over its pages and we know they will feel the same pride in the excellence of the work that we do. The Woman's Auxiliary to the Kentucky State Medical Association and to the American Medical Association have found a permanent place for themselves and will be heard from increasingly, both quantitatively and qualitatively as years go by.

### HYGEIA

The American Medical Association is rendering splendid service to the physicians of this country in publishing *Hygeia*, and we urge the physicians of Kentucky to make use of this service because now as never before it is necessary for the profession to exercise leadership and control in health matters. The public is being fairly deluged with fantastic "health advice" and "short cuts to health" through magazines, newspapers, and radio, and by quacks, cultists, and irregular practitioners. There is no better way to counteract false health advice than to keep *Hygeia* prominently displayed on your reception room table for use of waiting patients.

*Hygeia* helps physicians because it builds faith in scientific medicine, makes patients health-minded, puts them in a cooperative frame of mind, exposes quackery and banishes health superstition, discourages self-medication and urges early medical treatment, and leads to a better understanding between physician and patient.

Preceding the Christmas holidays this magazine can be secured for a full year for \$1.50. Write immediately to the office of this Journal or to the American Medical Association, 535 North Dearborn Street, Chicago, Ill., for full particulars.

### SPECIAL ARTICLE

#### A DOCTOR LOOKS AT MEDICAL SERVICE IN KENTUCKY

VIRGIL E. SIMPSON, A. B., M. D.  
Louisville.

Whether there exists an actual shortage of physicians in Kentucky depends, in some measure, on what may be defined as adequate medical service. Obviously such definition must be markedly in contrast with a definition of satisfactory service three even two decades ago.

Whether an analysis of the number and distribution of physicians in the state affords an adequate horizon for viewing the changing economical and professional conditions under which the practice of medicine is now carried on is susceptible of justifiable skepticism.

Whether our system of medical education has failed, signally, to keep pace with changing conditions and needs may be the subject of honest differences of opinion; that it fosters specialization and does not offer adequate training in the fundamentals of medical knowledge and practice scarcely merits consideration.

Whether increasing the number of graduates annually would insure relief from an existing faulty distribution of physicians in the state is, largely, an academic proposal.

Whether putting a hospital in every county would tend to better medical service has been satisfactorily answered by 42% of the counties, in the state.

Whether establishing scholarships by county or state would answer community needs cannot be stated, since it has not been tried.

Whether a community enjoys the kind of medical service it merits may not be universally true but as a practical working statement it is nearly so.

Whether or not a community must establish a social and economic status attractive to a graduate seeking a location is being answered by more than one hundred young men and women licensed to practice in Kentucky each year during the past five years.

Whether or not the question of nurses training and education of technicians should be linked with that of supply of physicians is subject to varying interpretations.

Whether a community should subsidize a physician or a hospital or both offers an attractive subject for discussion.

Believing that these are phases of a problem which the medical profession should properly lead in discussion of actual conditions, in inquiry as to causes, in offering plans for solutions, with the least expenditure of money, the shortest time for correction and the most equitable to patient, doctor and public alike, the conclusions, somewhat



tentative, of a single observer are briefly set down.

As an expert witness must establish his right to testify as an expert witness, likewise, it would seem appropriate that the writer establish the possession of some knowledge of the problems of a rural community, of the attractions of urban life, of the growth and development of medical science and practice and an intimacy with the problems of medical education.

As exhibit "A", the writer was born on a farm and lived his first eighteen years entirely and the next six largely thereon; and it was emphatically no suburban community in which he was reared but an isolated one, six miles from a post-office, three miles from a church, one and one-half miles from a school, and nine miles from a court house and a railroad. The family doctor lived five miles away; there were no telephones and the roads were "paved with red clay," dusty in summer and knee deep in mud in winter, hence, transportation was by horse back during winter months and cautiously by buggy or spring wagon during the summer. The doctor ploughed or bumped, depending on the season, his way over a territory exclusively his own some twelve by fifteen miles in area. He was the sole agency for relief from pain and fever; there was no mid-wife, osteopath, herb doctor, not even a veterinarian. So much for that experience. The next thirty years have been spent in the metropolis of the state, practicing his profession, the last twenty-eight in some teaching capacity in a medical college and yet another last fifteen in frequent contact with doctors and patients from the state at large as consultant. So much for exhibits "B", "C" and "D", and now for conclusions.

1. A better distribution of doctors over the state is admittedly desirable. It is stated that there is one doctor to 7,705 persons in Elliott County while in Fayette there is one to 420 population. There is but one answer to such a situation, undesirable as it is; Fayette County has made living and working there just eighteen times more attractive than Elliott has succeeded in doing. When Elliott County has built roads and homes and schools and churches and parks and has made her land productive, then and then only, will she enjoy the standard of living which Fayette makes her envy. A part of this constructive effort properly becomes the State's concern; the more progressive and wealthier counties helping the less prosperous. This is now obtaining in public school education and public roads. Every time five miles of road are built in Elliott County, Jefferson County builds two of them for her; every time a public school teacher is paid five dollars salary two of

them comes from Jefferson; but Elliott County must make it financially worthwhile for a newspaper to be published in its county seat; it must make it economically worthwhile for a bank to be established in its confines; if it wants a bus line it must make it worth while for one to operate. The opening of stores, of picture houses, of county fairs, the coming of a circus rests on a quid pro quo basis. By the same logic if Elliott County wants a good doctor it must somehow make its bid attractive. The capital wealth of a given community constitutes one of the criteria for judging the standard of living. The assessed wealth for Elliott County two years ago was \$178.00 per capita; the same year the assessed valuation for Fayette County was \$1,828.00 per capita; the assessed valuation for Menifee County was \$227.00 per capita while that for Woodford was \$2,100.00 per capita. This leads to conclusion:

2. Hospitals should be placed at strategic points over the state. One in every county seat should be the goal eventually. From an economic viewpoint it would appear that the state of Kentucky could be more economically governed if there were fewer counties in the state. At the time that Kentucky was originally grouped into its 119 counties (later 120) there were adequate reasons for limiting the area of county boundaries. Roads were bad and travel was consequently slow, time consuming and often done under hardships. But if the state were now broken into 50 counties instead of 120, the citizens of each county could get to their county seats in shorter time and with less inconvenience than obtained with the original 119. One may well wonder if the reduction in the number of counties in the state would not also be helpful from the standpoint of medical service. Certainly if the ultimate establishment of a hospital in each county seat is desirable the argument for such reduction in county seats is re-enforced. Many sick in rural communities would not go to a hospital; there exists prejudice against them as has been often encountered in the crippled children campaign. But this prejudice must be removed by education. That ones grandmother bore her children in her cabin home is no sort of argument against a hospital for the seriously sick. School sessions and church services were once conducted in homes, but not generally now. Standards of living have changed. So have medical methods and measures; operations were done in the home twenty-five years ago: now the *surgically* sick are transported by train or boat or motor to a hospital. The *medically* ill can be cared for in the hospital on an equal basis. With such a hospital in the county or with two or more counties supporting one

the sick of the county can be segregated, fewer nurses are needed, fewer doctors are needed, the transmissible diseases are better controlled and the well members of the family, not being required to nurse the sick member, can continue at their occupations. The hospital should care for both pay and indigent cases; the latter at the expense of the tax payers, the former at his own expense. With most of his sick under one roof the doctor could care for many more individuals than were he required to visit from house to house and in his absence from the hospital the nurse carries on. A county ambulance to carry the sick to the hospital is no more impossible than the consolidated rural school bus which now makes its rounds collecting children.

The present distribution of hospitals is given in the pamphlet on "Medical Service in Kentucky", a publication of the Department of Hygiene and Public Health, University of Kentucky, and shows, graphically, by maps, sections 20 miles or more removed from hospitals. The arbitrary selection of 20 miles is subject to discussion when accessibility is at issue. Much depends on roads, their condition and directness, on topography of the intervening country, adequacy of transportation and the size of the hospital in the 20 mile radius. Such a map largely visualizes the single factor—distance. Take Elizabethtown in Hardin County as a concrete example. It is located 36 miles by rail from Louisville and 49 miles by motor. The writer has driven to Elizabethtown many times in 60 minutes; an ambulance can easily cover the distance in 90 minutes; both Elizabethtown and Louisville have ambulance service. Can it be urged that a community within 90 minutes of adequate hospital bed capacity is confronted with serious unavailability? Again it is urged that the dearth of hospitalization facilities is greater than appears on the maps because many of the hospitals are inadequate for local needs. It is a rare experience, in Kentucky, to find a hospital operating to capacity. Many hospitals' ledgers run in the red from lack of occupancy of their beds. But again accepting the twenty mile radius of the authors it is interesting to study that section of the state designated as the "south west central" portion. This section shows 19 counties in whole or in part removed 20 miles or more from a hospital. That sounds formidable but the location of only 10 hospitals strategically placed solves their problem on a 20 mile radius basis.

One must also determine the number of beds per 1000 population that might be considered adequate. The ideal is far from the practical or even the necessary in the matter of hospital beds as in other matters. It is believed that 5 beds for general use (medical, surgical and obstetrical)

per 1000 population is an approach to the ideal. Carried further it is estimated that there should be 5 beds per 10,000 for communicable diseases, 5 beds per 10,000 for children and 45 per 10,000 for maternity cases and as many beds for tuberculous patients as equals the average number of deaths annually from tuberculosis.

As an illustration of the difference between the ideal and the actual need, Louisville may be used as an example. The Census Bureau has determined that the Louisville Metropolitan District extends north to Speed, Indiana, 16 miles, and south to West Point Ky., 25 miles, east to Shelby County line and west to the Ohio River and the Hardin County line. This area includes all of Jefferson County and a large part of Floyd and Clark Counties in Indiana. The district covers 463 square miles. In this "metropolitan area" Louisville has 2777 hospital beds and a population of 404,296. This offers one bed to approximately every 145 persons. This number is more than adequate with the present inclination of the people for hospital care as is proven by the fact that approximately 39% of all the patients in all the hospitals, except the City Hospital, come from out in the state and approximately 26% come from other states. Thus approximately 57% of hospital beds occupied in the city of Louisville come from outside the city. That such a considerable number of the patients cared for annually by Louisville hospitals come from nearly every county in the State makes the question of availability to hospitals one of dubious frontiers. Louisville as a medical center is ipse facto a consultation center and therefore its hospitals are called upon to accommodate a population several times greater than that included in its metropolitan area and it does this with less than 3000 beds.

These figures and deductions are based on the actual number of hospitals, their bed capacity and the population in Louisville embracing its metropolitan district and not on the figures listed in Appendix VI in the pamphlet issued by the Department of Hygiene and Public Health, University of Kentucky. In that appendix 4380 beds are listed for Jefferson County. I am listing all the beds in Jefferson County (2617) and all in Clark and Floyd Counties (160) in Indiana. The difference in the two sets of figures, 1763 beds, is too large to be of no significance.

### 3. Are Scholarships in Medical Schools Feasible and Possible?

In the "Study of Medical Service in Kentucky" it is stated that Menifee County has one doctor for every 5000 inhabitants, that there is but one doctor in that county and that he is 66 years old. Plainly, the citizenry of Menifee County should bestir itself if it



really wants one or more additional doctors. What does Menifee County do about a County Judge or a County Attorney or a public school teacher? It does not expect Christian County to send one of its judges or attorneys, or teachers over to work in Menifee. Neither may it expect one of Christian County's doctors to "come over to Macedonia to help" even if Christian County does have one doctor to every 605 inhabitants. But there is material in a number of Menifee County homes from which a good doctor can be made.

If no boy or girl in that county who is financially able to acquire a medical education wants to study medicine then the county, with some help from the state, can make it possible for some boy or girl to study medicine who does want such training but is financially unable to obtain it. A suitable committee could select a candidate by competitive examination from a group of applicants possessing preliminary qualifications. This committee might consist of the Fiscal Court with the County Judge, a member of the State Board of Health, a representative of the University of Kentucky, one from the University of Louisville Medical School and a representative from the local doctors. The successful applicant should agree to return to Menifee County after graduation and practice medicine for a specified number of years and for his agreement to practice there he is to receive his premedic training in the University of Kentucky and his medical training at the University of Louisville, Medical School. The cost of his premedic education may be borne by the state and the actual cost of his medical education may be borne by the county. The two years spent in premedic training at the State University would cost the state \$300.00 per year, a total of \$600.00. The cost of a medical education per year is approximately \$1200.00. Thus for an outlay of approximately \$4800.00 by the county it assures itself the service of a young doctor who knows the home people, understands their viewpoint and is in sympathy with their objective. For the Medical School the writer can say that such a student, having satisfactorily completed his work at the State University, will be admitted to and afforded every facility by the University of Louisville, Medical School for graduation.

A similar plan is now in operation in the state of Mississippi, though there the expense is met by the Commonwealth Fund and not by the taxpayers of the counties concerned. Provision is made for five free scholarships each year for medical students in Tulane University Medical Department from the State of Mississippi. Recipients of these scholarships must agree to return to Mississippi and practice medicine in a rural

community for a period of at least three years. This arrangement means that annually there will be 20 students in the Tulane Medical School from Mississippi on such scholarships. These scholarships are awarded by the Tulane School of Medicine from among the qualified applicants from Mississippi. There were forty such applicants in 1931. The essential difference between the Mississippi plan and the plan above proposed for counties in Kentucky is that the taxpayers of the counties in need of doctors be called upon to help defray the cost of such education while in Mississippi the state has been fortunate to arrange with the Commonwealth Fund to finance the training and therefore the candidates are selected from the state at large and are not obliged to return to any designated county to practice.

#### 4. Is There Need for an Additional Medical School in the State?

The compilers of the pamphlet on "Medical Service in Kentucky" say, "if Kentucky desires more medical recruits, she must provide the means for training them." The inference is that the state should establish a medical school. The expense of such a departure in education would encompass a staggering figure. What with additional buildings, equipment and salaries of teachers, the taxpayers would find it a heavy load. It costs about \$5000.00 to educate a student in a medical school; if the state goes into the business of furnishing doctors for its people it is assumed a nominal tuition only would be required of the student. Students in the University of Kentucky who are residents of the state now pay a tuition fee of \$31.00 per semester and the total expense is estimated by the Dean of Men for the University as ranging between \$250.00 and \$300.00 per semester or a total of 5 to \$600.00 annually per student. Since the actual cost of educating a medical student averages \$1200.00 per year the difference between the cost of an academic education as compared with that of a medical education, being in round numbers some \$600.00 per year, would have to be borne by the state. It will be borne in mind that this estimate of cost of educating a medical student to be borne by the state is independent of the initial outlay for a medical school plant. It is further assumed that a state medical school as a part of the University of Kentucky would endeavor to maintain a standard in keeping with that of other medical schools over the country. This means a Class A school, hence, a four years course and all of the essential subjects. Any other course would result in failure because should the state conduct a sub-standard school its graduates could never secure reciprocity with any other state. That the state could not and would not do this is evi-

denced by the standard maintained by the University of Kentucky in the colleges now in existence. They are not substandard and her educational leaders would not counsel the maintenance of a third rate medical college. Is there justification for the necessary outlay for a state medical school? The pamphlet estimates that 140 graduates yearly for the next ten years would be necessary to supply reasonably satisfactory medical care. The number is too large. Better transportation, more hospitals, added facilities for modern medical service, will enable a doctor to care for many more people than is covered by this estimate. But, ignoring the exaggerated assumption that 140 graduates per year for the next ten years are needed to furnish Kentucky with an adequate medical service, let us examine the present facilities for furnishing doctors for Kentucky.

TABLE I.

Class	1926	1927	1928	1929	1930	Total
Freshman	84	83	91	93	87	438
Sophomore	57	64	75	76	79	351
Junior	68	68	90	89	88	403
Senior	66	66	69	88	87	376
Total Matriculation						1,568

Table showing Matriculants by classes in University of Louisville Medical School covering the 5 year period from 1926 to 1930 inclusive.

The University of Louisville, Medical School, can admit, approximately, 100 candidates to its freshmen class each year. Applicants for admission who are residents of Louisville are first considered and, if qualified, are admitted. After Louisville applicants have been acted upon, applicants from Kentucky are next considered and every one presenting even the minimum requirements is accepted notwithstanding the fact that there are many applicants from other states who have superior qualifications. The school every year has admitted Kentucky applicants having the minimum premedic hours in academic work and therefore obliged to reject applicants having had three or more years in college and holding A. B. or B. S. degrees. No Kentucky student is refused an opportunity to study medicine in the University of Louisville, Medical School, on account of lack of room. Illly fitted and unfitted applicants for admission have been rejected and will be rejected in the future. The Medical School of the University of Louisville recognizes and assumes its obligation to train young men and women for entrance into the medical profession of this state. It does so in the face of criticism by the uninformed; it does so without encouragement from the state; it has maintained its standing as a Class A school deriving, in part, its income from the taxes levied on the citizens of Louisville for its maintenance. Candidates for graduation will continue to be carefully selected and the unfit rejected. This is a policy adopted by the council on medical education and hospitals of the American Medical Association, by the Federation of State Boards and ap-

proved by the medical profession at large in a voluntary effort to supply the public with qualified doctors. As an example of this care for the public's interest the following resolution is selected:

"Whereas, The recently published survey conducted by this council discloses a wide discrepancy in the policy of approved medical colleges toward students repeating the work of the previous year, and

Whereas, Superficial investigation of the history of a few said students and one notably liberal institution reveals obvious unfitness in the former, and undoubtedly low standards of teaching in the latter, and

Whereas, Medical schools regularly permitting more than an occasional student to repeat his previous year's work are frequently contributors to the problems facing this council which originate in commercialism; therefore, be it

Resolved, That the Council on Medical Education and Hospitals pursue to its logical conclusion the investigations begun in regard to "repeaters" among medical student to the end that unqualified students may not be graduated and commercially tainted medical schools may thereby be disorganized."

(From the Records of Council on Medical Education and Hospitals of the A. M. A.)

TABLE II.

State	1926	1927	1928	1929	1930	Total
Residents	33	30	23	35	35	156
Non-Residents	33	36	45	52	52	218
Total Graduated						374

Table showing graduates in University of Louisville Medical School covering 5 year period from 1926 to 1930 inclusive.

TABLE III.

How Licensed	1927	1928	1929	1930	1931	Total
Examination	78	74	64	77	70	363
Reciprocity	39	45	53	33	—	190
Total Licensed						553

Table showing licentiates by State Board for 5 year period covering 1927 to 1931 inclusive.  
(Compiled from Kentucky State Board of Health Records).

During the past five years the Medical School in Louisville has had 374 graduates; 156 of these were Kentuckians. During this same period 480 were admitted to the freshman class; all of these could have been Kentuckians if that many in the state had wanted to enter medicine.

TABLE IV.

How Licensed	1927	1928	1929	1930	1931	Total
Examination	31	31	25	35	41	163
Reciprocity	6	12	15	12	2	47
Total Licensed						210

Table showing Kentuckians licensed by State Board for 5 year period covering 1927 to 1931 inclusive.  
(Compiled from Kentucky State Board of Health records).

During the last five year period 235 graduates from medical schools outside the state have been licensed to practice in Kentucky—an average of 47 per year. During this 5 year period 553 doctors have been licensed to practice in the state; of these 343 were natives of other states, while only 210 were Kentuckians.



TABLE V.

How Licensed	1927	1928	1929	1930	1931	Total
Examination	14	13	11	15	6	59
Reciprocity	34	41	48	53	20	176

Total Licensed ..... 235

Table showing licentiates from Medical Schools other than the University of Louisville for 5 year period covering years 1927 to 1931 inclusive.

(Compiled from Kentucky State Board of Health records).

During the past five years an average of 110 doctors have been licensed to practice in Kentucky yearly. The Medical School of Louisville has graduated an average of 74 yearly; an average of 47 yearly have come from other schools. It is believed these 110 new recruits annually to the medical profession in the state would be adequate to meet the normal growth of the state if all of them found conditions here satisfactory.

TABLE VI.

How Licensed	1927	1928	1929	1930	1931	Total
Examination	47	43	39	42	29	200
Reciprocity	33	33	38	21	18	143

Total Licensed ..... 343

Table showing licentiates, natives of other states, admitted to practice in Kentucky during 5 year period covering 1927 to 1931 inclusive.

(Compiled from Kentucky State Board of Health records).

The feature of real concern in this study is discovered in the startling fact that in this 5 year period being analyzed, 389 doctors have removed from the state and located elsewhere. Twenty-five of this number were internes in local hospitals and cannot properly be said to have located here. But 364 have deliberately left the state. Why? Certainly their leaving had no relation to medical education in the state; undergraduate problems were of a water that had already gone under their mill whether graduates in Louisville or elsewhere.

TABLE VII.

	1927	1928	1929	1930	Total
Removals	68	69	81	100	364

Table showing licentiates to practice in Kentucky who have left the state to practice during 4 year period covering years 1927 to 1930 inclusive.

(Compiled from Kentucky State Board of Health records).

The establishing of another medical school preserving Class A standards could not add to the invitation Kentucky offers these men to remain and work among her people. The establishment of another medical school discarding Class A standards would turn loose in the state annually a group of men and women inadequately trained and whose location in the state could have but the one effect of obliging more, rather than less, well prepared doctors to locate in other states. A relatively small per cent of our people possess a perspective enabling them to elect the adequately trained. The east would prove the deciding factor in a very large group.

TABLE VIII.

	1927	1928	1929	1930	Total
Deaths	69	89	80	71	309

Table showing deaths of Kentucky licentiates during 4 year period covering years 1927 to 1930 inclusive.

(Compiled from Kentucky State Board of Health records).

Before the Great War, Germany had a very elaborate food inspection machinery. Meats, for example, were rigidly inspected and

classified. The bad meat was properly labelled, but, strangely, was allowed to be sold. The poor and ignorant bought it, because it was cheap, but their health was not conserved by the inspection system. Advocates of the proposal to admit students to medical schools with only a high school education or of a plan for graduation of such students after 2 or 3 years of training in the Medical School, or of a proposal to conduct a Medical School in a municipality too small to furnish adequate clinical material for teaching are, indeed, inspecting and grading the public's professional "meat" but permits, even invites, the sick to depend upon a skill and training but little better than that of the old doctor of a half century ago. Such a radical departure from the present plan of training doctors would have another definite effect; it would practically put a quietus on malpractice suits. This may prove food for reflection for the General Assembly members who are attorneys.

#### 5. Does Present Day Medical Education Encourage Specialization?

This question is answered in the affirmative by most laymen; it is frequently so asserted by physicians who graduated more than a decade ago or who are located in rural communities. It also appears to be an opinion shared by the authors of "Medical Service in Kentucky." Nearly all of the faults found with medical practice are attributed to the curriculum.

It is not claimed that the medical curriculum as now in effect is not susceptible of improvement. We believe that it is, but a broader understanding on the part of its critics of the real aims of a medical school should be sought for. To affirm that the object of a medical school should be to turn out a general practitioner or to develop a specialist, or to produce a research worker is merely beclouding the issue, for it is wholly beyond the control of one's Alma Mater to determine what the ultimate field of practice of a graduate shall be. The medical student must get a knowledge of medicine in four years of eight months each, or a total of 32 months or 128 weeks, or approximately 5000 hours. It is generally agreed that during this period of undergraduate study he must be given as comprehensive an understanding of the major subjects in medicine as is possible. That the medical teachers of the present day are not wedded to custom, nor bound by precedent is evidenced by the fact that the present curriculum is as different, even more different, from the older medical school curricula than is the curriculum of a School of Electrical Engineering today compared with that of a quarter of a century ago. In other words the present medical curriculum is a matter of growth, it is distinctly a variant created to meet the tremendous development of medical science, as well as, the result of an effort to adapt it to modern sociological



conditions.

There are a few heavily endowed medical schools that emphasize the scientific interest in medicine. Such interest is highly desirable since it is through the laboratory and experimental aspects of the art and science of medicine that the doctor at the bedside is furnished new tools for combatting disease. It is in such schools that the scientist finds opportunity to follow his bent, relieved from the distraction of a competitive struggle for his daily bread. And here too, the ranks of these few scientists may be recruited by admission for undergraduate study those young men and women who have discovered the zeal for research. Such schools are too few and such students are rare.

Then there are a few medical schools in the United States that have adopted, either tentatively or unequivocally, what may be described as the elective system. This means that a certain number of hours in the course are fixed and mandatory while a lesser number are allotted to no subject and which the student may elect to devote to such subject or subjects as he finds especially interesting. There were fourteen such medical schools in 1930.

Since 1923 the Association of American Medical Colleges has been studying the curriculum of medical colleges through its Committee on Education and Pedagogies. Dr. Ray Lyman Wilbur, then president of the Leland Stanford University and now Secretary of the Department of the Interior, has served on that Committee and its membership has been composed of prominent medical educators since 1923, when its initial report was adopted. That Committee has endeavored to avoid undue standardization of the medical school curriculum by providing for a rather wide zone between the minimum and maximum number of hours allotted to each subject taught. Whether undue emphasis is placed upon the subjects which afford the greatest opportunity for specialization can be considered more intelligently if the following table be studied. In this table the number of hours required for each subject is placed under the headings "Minimum" and "Maximum" as well as, the "average" required in 38 medical schools in 1930. Under the heading "A. A. M. C." is placed the maximum and minimum hours recommended by the Association of American Medical Colleges.

TABLE IX  
(Curriculum of 38 Medical Schools).  
(First 17 are required courses).

Courses	No. of Schools	Minimum Hours	Maximum Hours	Average Hours	A. A. M. C. 1923
Anatomy.....	38	480	1185	780	471-814
Physiology.....	38	187	674	268	151-264
Chemistry.....	38	153	384	234	118-198
Pathology.....	38	170	548	376	337-572
Bacteriology...	38	108	352	193	135-220
Pharmacology...	38	100	316	196	
Pub. Health	}				
Prev. Med.					
Hygiene	38	30	298	86	101-176

Medicine.....	38	472	1040	761	673-1166
Dis. of Children.....	38	21	384	158	
Dis. of Nerv. System...	38	48	314	130	
Skin and Syphilis.....	38	11	135	64	
Surgery.....	37	375	872	586	457-770
Orthopedics....	34	8	140	51	
Eye, Ear	}				
Nose and Throat					
Obstetrics.....	30	80	278	176	135-220
Dis. of Women	30	33	294	105	
Elective.....	13	80	520	248	808
Total ..		2,67	944	4522	3366-4400

A doctor who does what is termed *general practice* in a town or rural community will be called on to treat medical cases in adults and children, to do some general emergency surgery and to attend childbirths. Such work will constitute 85% of the illness of a community; the remainder of the work composed of chronic cases and the rarer diseases requiring greater experience will be seen by the consultant. A study of the table shows that 2133 hours are allotted to the fundamentals listed as the first seven subjects in the table which every medical student in every medical school must take. The total average number of hours in a four years course is 4422; subtracting the hours allotted to fundamentals there remains 2041 exclusive of the electives. To general practice, general surgery, diseases of children and obstetrics are allotted 1681 hours or 82% of the total curriculum hours. There remains 18% or 360 hours which are devoted to the subjects, eye, ear, nose, throat, diseases of the nervous system, women, and skin, syphilis and orthopedic surgery, which the student must take. Time to acquire barely sufficient knowledge to enable this same student, who is expected to become a general physician, to merely recognize the commoner manifestations of diseases falling in these subjects.

Does this analysis of the time spent by the medical student in college warrant the affirmation that "the whole spirit of medical education has been such as to encourage narrow specialization for the exceptional student" as is made by the authors of Medical Service in Kentucky?

#### 6. Economic Crises and Medical Service.

It is interesting to speculate on the possible effect of the present financial and industrial strain on medical service in Kentucky. Already an exodus of doctors from the larger centers to the less urban communities is noted. This movement will continue and may gain momentum if the strain persists which it seems now is certain for an indefinite period. The greater the depression the further into the rural section will the less successful doctor go. During the boom days of 1923 to 29, the flow of doctors toward the cities was definite; in the lean days of 1930 to an indefinite period in the future the ebb toward the rural communities will be just as strong. This will result in a better distribu-

tion of doctors. Since this has been the plaint of lawmakers and sociologists alike for many years, one might feel indeed 'tis an ill wind that blows no one any good.

Yet another effect that will bulk fairly large in the wake of this depression will be the diminishing number of matriculates in medical schools over the country. Already we are feeling this influence in the matriculation for the freshman class in the University of Louisville. Applicants after being accepted for admission to the medical school are finding themselves, in increasing numbers, unable to make the necessary financial arrangements. But, offsetting this potential reduction in graduates from the medical schools will be noted a definite decrease in the birth rate of the nation. Here, as elsewhere and always, the stern justice of the law of supply and demand will prevail.

#### 7. Shall the Practice of Medicine Remain a Profession or Shall It Be Made a Mere Vocation by Legislative Enactment?

In answering the question what makes a profession W. A. Shumaker, Editor of Law Notes said: "If there is such a thing as a profession as a concept distinct from a vocation it must consist in the ideals which its members maintain, the dignity of character which they bring to the performance of their duties and the austerity of the self-imposed ethical standards. To constitute a true profession there must be ethical traditions so potent as to bring into conformity members whose personal standards of conduct are at a low level and to have an elevating and ennobling effect on those members. A profession cannot be created by resolution or become such overnight. It requires many years for its development and they must be years of self-denial, years when success by base means is scorned, years when no results bring honor except those free from the taint of unworthy methods."

In discussing what a good doctor must know Glenn Frank, President of the University of Wisconsin said in a recent address that a good doctor must know almost as much about the mind as the psychologist; that he must refuse to be a party to the ironic paradox of commercializing a profession just when the professionalization of commerce begins to dawn and that, finally, he must know almost as much about the subtle art of counselling as the priest.

Speaking of individualism in Medicine, Dr. Wm. S. Thayer, Emeritus Professor of Medicine, John Hopkins Hospital, said in 1929 that "the practice of medicine is an affair between two human beings in which the human element is all important; that the practice of medicine is a profession and he who seeks to make it a business or a trade has mistaken his calling."

Discussing the character of medical service, Dr. Charles G. Heyd, President of the New York County Medical Society said in

1931 that "medical service cannot be fabricated like an automobile. In the mechanical arts it is possible to make the product the same irrespective of number and by mass production to make it cheaper. Preventive medicine lends itself to a degree to the application of mass production laws. Curative medicine is not fabrication or assembling; it is the study of a disease in an individual modified by his personality and hereditary background under varying conditions of environment and competency."

That incomparable physician and teacher, William Osler, said in "Aequanimitas and Other Addresses" that "The practice of medicine is an art based on science" and described it as a "calling which offers a combination of intellectual and moral interests found in no other profession and not met with at all in the common pursuits of life."

It may be reflected that the marvelous growth of its scientific aspects during the past two decades since Osler thus spoke has, in no essential particular, lost to medicine its great human and individual value.

Dr. Beverly Douglas, Vanderbilt University, Medical School, speaking of desirable attributes in the student at the 1928 session of the Section on Medical Education, Southern Medical Association said that in addition to intellectual background and professional training he must "have qualities of heart and spirit above the average man;" that in addition to intellectual curiosity and enthusiasm he must have a sense of honor for "there is no excuse for a medical school wittingly to graduate a dishonest or immoral man."

Osler again wrote in "The Master Word in Medicine" essay "The practice of medicine is an art, not a trade; a calling, not a business; a calling in which your heart will be exercised equally with your head."

8. Finally, it is comforting to find oneself in accord with those of his fellows who are themselves qualified to sit in judgment.

The Jefferson County Medical Society, with a membership of 432 doctors in Louisville and Jefferson County, a membership composed of both general practitioners and specialists, of those teaching and those not teaching, passed the following resolution unanimously: (May 4th, 1931.)

"Believing that adequate medical service in Kentucky should be made available to all of her people and

Believing that each county and each community should assume the major responsibility of providing themselves with such needs and

Believing that faulty distribution rather than insufficient numbers of physicians in the State constitutes the heart of the problem and

Believing that unattractive living and working conditions in communities where inadequate medical service is now apparent is far more responsible for the existence of such conditions than the character of training given by present



day medical schools and

Believing that the organized medical profession should assume leadership in uncovering the causes which led to the present condition and discovering the remedies for its relief,

The Jefferson County Medical Society declares as its deliberate judgment that:

1. Under the present conditions a graduate of a medical school cannot be expected to locate where living conditions for himself and his family are plainly uninviting.

2. Isolation and distance from large urban centers are not insuperable barriers as is evidenced by the relative ease with which a commercial or mining industry secures satisfactory medical care.

3. Physicians now located in communities removed from centers of population do not receive the loyal support of the sick in their community, to which they are entitled; this is true, especially, of the wealthier for they voluntarily seek medical aid in the larger centers.

4. A county can build and maintain a hospital as well as it does a Court House or a public school. The health of that community is as vital to the happiness of its people as is education or legal processes.

5. With a hospital for pay and indigent patients a community would experience no more difficulty in securing one or more physicians to work in it and the community on a fee or salary basis than it now experiences in getting county and circuit judges or principals and teachers.

That the compensation of such physicians must be larger than that of the county judge or public school teacher is obvious because of broader training.

6. If a county as a unit offers comforts, conveniences and facilities unattractive to a non-resident medical graduate it can educate one or more of its own sons or daughters by establishing a scholarship covering premedic and medical education and training with a term contract for five or more years practice in that county.

7. That the public health boards are necessary in our complex civilization; but they are limited users and rarely creators of medical knowledge and growth and should be the agencies of the organized medical profession. Through such agencies the profession should function in well defined and definitely circumscribed activities."

The medical profession has given the present generation all the protection it enjoys against disease and epidemics, all the freedom it possesses from disability and deformity, all the added expectancy of life; it has created its own standards of education and has constantly revised them upward; it has established its own sphere of service and has persistently refined and broadened it; it has initiated and supported every helpful legislative enactment pertaining to the people's health in both state and nation. In short, its record is a record of service to the unfortunate and fidelity to its ideals—surely it can be trusted to lead in the solution of the weaknesses of Medical Service in Kentucky.

## OFFICIAL ANNOUNCEMENTS

### MINUTES OF THE ELEVENTH ANNUAL MEETING OF THE EYE, EAR, NOSE AND THROAT SECTION OF THE KENTUCKY STATE MEDICAL ASSOCIATION, LEXINGTON, SEPTEMBER 7, 1931

#### MORNING SESSION

This is a called meeting of the Section, as owing to the death of J. A. Stucky, Lexington, and R. C. Lynch, New Orleans, while enroute to attend the regular meeting in May, that meeting was postponed.

The meeting convened at ten-thirty o'clock in McVey Hall, of the University of Kentucky, W. P. Drake, President of the Section, presiding.

Invocation by Reverend R. H. Daugherty. Memorial services for Dr. Stucky and Dr. Lynch were conducted by the Memorial Service Committee, who introduced resolutions, copies of which were sent to the families of Dr. Stucky and Dr. Lynch. Dr. S. B. Marks read an editorial on the death of Dr. Stucky which appeared in the Lexington Herald. He also read an editorial on the death of Dr. Lynch which was taken from the New Orleans paper. Words of eulogy were spoken by A. T. McCormack, Louisville; D. M. Griffith, Owensboro, and Miss Linda Neville. Motion was made that these remarks be added to the resolutions presented by the Memorial Service Committee and also be sent to the families of Dr. Stucky and Dr. Lynch. The Council of the Kentucky State Medical Association attended the Memorial Services in a body.

The following resolutions were adopted:

#### RESOLUTIONS ON THE DEATH OF J. A. STUCKY ADOPTED BY THE EYE, EAR, NOSE AND THROAT SECTION OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Joseph Addison Stucky, the son of Harry Stucky and Mrs. Sallie Kemp Sweeney Stucky was born in Louisville September the sixth 1857.

Dr. Stucky graduated in medicine from the University of Louisville in 1878 and came to Lexington soon after, in which city he was in active practice until the time of his death.

For nine years he engaged in general practice and for the remaining forty-four years limited his practice to the diseases of the eye, ear, nose and throat, in which branch of medicine he became widely known throughout the whole United States.

Dr. Stucky was a charter member and a past president of the American Laryngological, Rhinological and Otological Association and the Academy of Ophthalmology and Otolaryngology, a fellow of the American College of Surgeons and had served as Chairman of the Section of the Eye, Ear, Nose and Throat of the American Medical, The Southern Med-



ideal and the Kentucky State Medical Association and many times sat in the various councils of the societies devoted to his specialty, particularly in the early days of their existence and added his advice and enthusiastic support to their government and policy.

Dr. Stucky was the author of many articles which have been published in the medical literature and was a pioneer in the study of diet in its relation to the diseases of the eye, ear, nose and throat.

He was a delegate to the International College of Surgeons in 1912 and for many years and at the time of his death was a member of the editorial Board of the *Annals of Otolaryngology and Rhinology*.

Dr. Stucky was for many years an active member of the medical staff of the Good Samaritan and St. Joseph Hospitals at Lexington and devoted much of his time and skill to the care of the indigent sick of his community.

He also was well known for his lectures on Public Health and Social Welfare subjects. He was also an active member and past president of the Lexington Kiwanis Club.

Dr. Stucky was a member of the Central Christian Church of Lexington and a devoted Christian, husband and father.

No man gave more largely of his excellent advice and counsel both to the younger members of his profession and to the trained nurses than did Dr. Stucky and he numbered among his best friends many of the younger members of the various societies of which he was a member.

Dr. Stucky's most outstanding accomplishment was the holding of clinics in the Kentucky mountains, far from a railroad and to which he transported his equipment in wagons and he and his assistants rode horse or muleback often contributing greater part of the expense himself, for the study and treatment of trachoma which at that time was so prevalent in this region.

He finally succeeded in engaging the interest of the United States Public Health Service, which with the cooperation of the State Board of Health established hospitals, for the care of trachomatous cases which are now so few as to be cared for by the one institution located at Richmond.

Dr. Stucky was possessed of much personal charm, was rarely gifted as a speaker and endeared to himself all who knew him. Few men have radiated more cheer nor given more happiness than he, for he thought largely of others and loved his kind.

Let it be the wish of the Eye, Ear, Nose and Throat section of the Kentucky State Medical Association that this memorial be spread upon its records in his honor and

further that a copy be sent to his bereaved family.

Robert H. Cowley, M. D.  
Samuel G. Dabney, M. D.  
Daniel M. Griffith, M. D.  
John D. Williams, M. D.  
Henry G. Reynolds, M. D.  
Sam B. Marks, M. D.  
Committee.

RESOLUTIONS ON THE DEATH OF R. C. LYNCH.  
ADOPTED BY THE EYE, EAR, NOSE AND  
THROAT SECTION OF THE KENTUCKY  
STATE MEDICAL ASSOCIATION

Since Dr. Lynch met with a fatal accident, while visiting Dr. Stucky at Lexington, upon the day before the Annual Meeting of the Eye, Ear, Nose and Throat section of the Kentucky State Medical Association which was to have been held at Bowling Green on the twelfth of May and upon which occasion he was to have been our honored guest it is fitting that this body at this, its postponed meeting should do him honor and pay tribute to his memory.

Robert Clyde Lynch, the son of Dr. William Mercer and Mrs. Minerva Maitland Lynch, was born at Carson City, Nevada, upon September 8th, 1880, and became a resident of New Orleans at the age of three years when his parents made this city their home.

He obtained his early education in the schools of his home city and graduated in medicine at Tulane University in 1903.

After graduation, having served his internship while still a student, he engaged in general practice for somewhat over one year at Natchez, Mississippi. He then returned to New Orleans and re-entered Tulane for one year for the study of Otolaryngology. He then went to Vienna to continue his studies for six months and returned to New Orleans to practice his specialty.

Then began for him a career of twenty-one years of intensive work; teaching at the Tulane Post Graduate Medical School, being the head of the Otolaryngologic Department for many years past, and closely identified with the Eye, Ear, Nose and Throat Hospital of which institution he had become Chief Surgeon shortly before his death. He was also consultant in Otolaryngology at the Toussaint Infirmary.

Even though his teaching and hospital affiliations and his very extensive practice kept him very busy, often far into the night, he found time for many improvements and inventions in the development of a much more adaptable suspension laryngoscope and many special instruments used in laryngoscopic operations.

He further improved the technique for and developed an external operation upon the

frontal and other sinuses, following somewhat that of Knapp, which has become the best known and most used operation for this condition in this country.

During the past few years he succeeded in producing moving pictures in colour of the functioning vocal cords and in addition developed a technique for partial removal of the internal laryngeal structures in cancer of the larynx under suspension laryngoscopy and also perfected his operation for laryngectomy, all of which were reproduced in moving pictures for teaching purposes.

Dr. Lynch was an active member of the American Laryngological Association, the American Laryngological, Rhinological and Otolological Society, the American Academy of Ophthalmology and Otolaryngology, the American College of Surgeons, a past president of the American Bronthoscopic Society, and had served as chairman of his special section of the American Medical and Southern Medical Associations.

He always showed active interest in the American Board of Otolaryngology and had served on this board since its inception.

Dr. Lynch was a prodigious worker, an indefatigable student, a patient teacher, a forceful speaker and a fluent writer and had made himself well known to Otolaryngology not only in this country but abroad as well.

Dr. Lynch was richly endowed with gentility and personal charm and his loss will not only be greatly felt by his hundreds of friends and patients in his home city and beloved Southland, but by his friends and confreres throughout the whole country not only as a friend but as an outstanding figure in his chosen specialty.

Let it be the desire of this body that this memorial be spread upon its records, and further that a copy be sent to his bereaved family.

Sam B. Marks, M. D.  
Robert H. Cowley, M. D.  
Samuel G. Dabney, M. D.  
Daniel M. Griffith, M. D.  
John D. Williams, M. D.  
Henry G. Reynolds, M. D.  
Committee.

President Drake read his address, *Malignancy of the Upper Respiratory Tract*.

The following papers were presented:

An Unusual General Condition with First Symptoms Appearing in the Eye, by Charles K. Beck, Louisville; discussed by A. J. Miller, Louisville, G. C. Hall, Louisville, Adolph Pfingst, Louisville.

Sinus Thrombosis and Osteomyelitis Complicating the Frontal Sinuses, by A. L. Bass, Louisville; discussed by D. M. Griffith, Owensboro, G. C. Hall, Louisville, S. G. Marks, Lexington, H. D. Abell, Paducah;

closing discussion by A. L. Bass.

The meeting adjourned at one o'clock for luncheon, a delicious luncheon being served in the dining room of McVey Hall.

#### AFTERNOON SESSION

The following papers were presented:

Cross Cylinders and Demonstrations of Their Uses; by R. H. Cowley; discussed by Milton J. Stern, Lexington, C. T. Wolfe, Louisville, closing discussion by R. H. Cowley.

Hay Fever, by E. V. Edwards; discussed by R. M. Armstrong, Lexington, S. B. Marks, Lexington, M. C. Baker, Louisville, E. C. Yates, Lexington, A. L. Bass, Louisville, closing discussion by E. V. Edwards.

Acute Mastoiditis: When to Advise Surgical Treatment, by L. P. Molloy, Paducah; discussed by C. T. Wolfe, Louisville, J. D. Williams, Ashland, E. C. Yates, Lexington, closing discussion by L. P. Molloy.

#### BUSINESS SESSION

Motion to disband the Section made by E. C. Yates, Lexington, seconded by C. T. Wolfe, Louisville. After discussion, amended by Adolph Pfingst, Louisville, seconded by G. C. Hall, Louisville, put to vote and carried, that action be deferred until the next regular meeting and that notice be sent that it is to be voted upon at that meeting.

The following officers were elected:

W. N. Offutt, President  
E. C. Yates, Vice President  
Carleton Thomas, Secretary  
S. B. Marks, Treasurer.

Louisville was selected as the next place of meeting.

S. B. Marks was instructed to send Dr. Lynch's family a check for his expenses incurred to attend the May meeting as guest of honor.

The subject of members delinquent in the payment of their dues was discussed briefly but since decision had been made at a former meeting, no further action was taken.

E. V. Edwards, Mayfield, brought up the subject of the Blind Committee of Kentucky appointed by the Rotary Club, and made a motion that their work be commended by this Section. After discussion the motion was put to a vote and carried.

The following papers were presented:

Some Points in the Management of Heterophoria, by C. D. Townes, Louisville; discussed by Carleton Thomas, Lexington; no closing discussion.

Lung Abscesses, by Wallace Frank, Louisville; discussed by G. C. Hall, Louisville, M. C. Baker, Louisville, C. T. Wolfe, Louisville, J. D. Williams, Ashland, E. C. Yates, Lexington, S. B. Marks, Lexington, closing discussion by Wallace Frank.



## OFFICERS' REPORT

S. B. Marks, Lexington, reported \$375.00 in the treasury.

Motion made by S. B. Marks that the committee on arrangements for the general meeting be thanked for also making arrangements for this meeting, seconded, put to vote and carried.

Motion also made by S. B. Marks that the University be thanked for the use of the McVey Hall, seconded, put to vote and carried.

Upon motion regularly made and seconded the meeting adjourned at five o'clock.

CARLETON THOMAS, Secretary.

## ORIGINAL ARTICLES

## PRESIDENT'S ADDRESS

## CANCER OF THE UPPER RESPIRATORY TRACT\*

W. P. DRAKE, M. D.

Bowling Green.

The origin of cancer is still an unsolved problem. It is rather the fashion of some at present to belittle the results of laboratory investigation; yet if asked the question whether one would prefer to have had a malignant disease thirty years ago or to have it today, unquestionably the answer would be today. Three decades ago we were attempting to explain why sarcoma was more common in youth and carcinoma more common in advanced life; in other words, why the same process should attack connective tissue in the young and epithelium in the old. We know today that sarcoma, like carcinoma, becomes more frequent the greater the burden of the years, and it is strongly suspected that age in itself may really have nothing to do with the inception of malignant disease, save only that long life means an extended period throughout which the action of an irritant can be exerted.

On the other hand, experimental research shows that the cause of cancer lies even beyond irritation or injury, which, however, may prepare a fertile soil favorable for the growth of the effective agent of malignancy. Cancer and tumor formation may be the result of evolutionary changes and may be enhanced by the changes occurring in the life of the individual. The human organism is a highly complex electro-chemical structure. Tissues may resist chronic irritation rather successfully, so long as the basic chemistry of the body remains unaltered; but under other conditions, such irritation may suffice

to break down that delicate intercellular balance and a new growth will arise. Tissue resistance is due to the stability of the cell's chemical structure. This stability depends upon its atomic structure, which is influenced by electronic activity. This stability is also influenced by the stability of the adjacent cells.

Probably the rapidity of modern life, infections, and poor hygiene contribute to upset further the basic electro-chemical formula, thereby causing inferior tissue resistance. The fact that tumors are relatively infrequent in childhood may be due to the fact that the child is closer to the embryo and has a better balanced chemistry and hence a better tissue resistance. It appears that cancer may be the result of agencies from within the body due to bio-chemical dysfunction affecting the life history of the embryonic cells.

It is possible to assume that some of the natural laws of balance influencing planets likewise affect the cell and that the degree of balance or stability determines the action of the cell. The cell is dormant if stable. An active cell depends upon an unstable stability. It becomes pathologically active as the instability increases and undergoes dissolution if the instability is marked.

It is a fact that nervous tissue is the most highly developed of all tissue and has a profound influence on metabolism. No doubt nervous tissue plays an important part in atrophies and hypertrophies and controls the activities of many, if not all, specialized tissues. Therefore, nervous tissue should be considered in new growth.

The causes of cancer may be classified under three heads: first—hereditary constitutional tendency; second, acquired constitutional tendency; third, exciting agent, such as an irritant. The amount of irritation required to produce a cancer is less if either or both of the other causes are marked. The hereditary tendency would not be as great if the cancer of the parent was accidental or due chiefly to excessive irritation. The hereditary tendency would be greater if the parent had inherited a tendency to cancer. The cutting off the tails of generations of rats would not breed rats without tails; but if two rats born without tails could be mated, no doubt rats without tails would be produced. Therefore, a husband and wife, free from hereditary constitutional tendencies will have children with a greater resistance to cancer.

The acquired constitutional tendency depends upon the accidents and insults inflicted upon the fertilized ovum, the fetus, the child and the adult. Therefore, if a cancer were to occur in an adult, free from hereditary tendency, without evidence of undue irrita-

\*President's Address before the Eye, Ear, Nose and Throat Section of the Kentucky State Medical Association, Lexington, September 7, 1931.



ference in percentage of cure in the different grades. A patient with grade one carcinoma has a one to three chances of being cured three to five years, while a patient with grade four has only a one to seventeen chance of a three year cure and probably none, we would suspect that he had an acquired tendency. Where the hereditary and irritation are both marked, a study of his personal history is of little comparative value. If neither of these is present, his personal history is important. The study of cancer patients who have no history of hereditary or excessive irritation is a very promising field as far as prophylaxis is concerned, if not actual treatment. At times, the study of this hypothesis seems to suggest a possibility of a new agent which will bring about a gradual abatement or dissolution of the cancer cells.

Tumors vary greatly in the degree of their malignancy, which depends not only upon the type, but also upon certain characteristics of individual tumors of the same type. The malignancy of any given tumor of any one type depends upon two things; first—on the number of mitoses present in the tumor cells; and second—on the ratio of differentiated to undifferentiated cells in the growth. All cell growth tends to differentiate into some one type of cell—osteoblast, fibroblast, etc. Borders has graded tumors according to their malignancy into group one, two, three and four.

Radium has given a fresh impetus to the histological study of cancer, for many pathologists consider that the explanation of radio-sensitivity and radio resistance is to be found in the pathology of the cancer cell. It is a well recognized biological law that there is an inverse relationship between the process of differentiation and specialization (development of functions) on the one hand, and the powers of reproduction on the other. Thus a carcinoma increasing, by geometrical progression without differentiation, will grow faster and be more malignant than one in which the cells undergo some degree of differentiation, with corresponding diminution in reproductive activity. The process of differentiation is a self imposed break and malignancy is dependent upon the relationship between the rate of growth and the degree of differentiation. Where the stimulus to differentiation has been much greater than that to reproduction the cancer cells kill themselves by forming epithelial pearls.

It is fair to assume that the rate of growth of a cancer is the main factor determining how soon the patient seeks treatment. There is a difference of time in seeking this advice from seven months in grade one to three months in grade four. There is also a dif-

ference for a five year cure. Thus it is shown that there is a direct correlation between the histological classification of epithelioma, their rate of growth, their prognosis as to cure and post operative length of life.

In leaving the discussion of the general subject of cancer and in considering growths of the upper respiratory tract, your attention is first called to the diagnosis of malignancy of the nasal sinuses.

Carcinoma is rare in the nose and sinuses under forty years of age. Sarcoma may occur at any age. When the growth is primary in the antrum, pain in the alveolus is usually the first symptom and is invariably attributed to the teeth, one or more of which may be pulled without relief.

The infiltrating tumors are by far the most important from the standpoint of an early diagnosis, both on account of their greater malignancy, and because signs and symptoms by which they may be suspected are obscure and often neglected. Here as elsewhere, it is the character of the histological structure of the growth which determines its progression, for not infrequently there is widespread involvement in the neighboring areas, sometimes death following within a few weeks.

Transillumination and X-ray may give little or no evidence of the trouble. If the patient is within the carcinoma age and the symptoms cannot be explained on other grounds, the antrum should be opened through the canine fossae and the microscope should be made use of, to settle any doubtful appearances. In no other way may these growths be caught in their incipency.

Primary tumors of the ethmoid usually arise in the posterior cells. If the patient has chronic ethmoiditis with polyp formation, small neoplasms in this region are difficult to recognize and are often removed in the course of an ethmoid operation and discarded without examination. Such tissues as cannot be pronounced simple polyps should be sent to the pathologist for further examination.

In malignancy of the ethmoid, bleeding and nasal obstruction are classical symptoms and occur in a large percentage of cases. Pain may sometimes be absent, it may sometimes be severe. Pain may be frontal, temporal, or referred to the eye. Reduction of vision and even optic atrophy may be present.

Malignancy of the frontal sinus may be mistaken for chronic sinusitis and menigeal and cerebral symptoms may ensue before a correct diagnosis is made. It is encouraging to know that neoplasms in the frontal sinuses are rare.

The greater number of neoplasms in the pharynx and nasopharynx are malignant and are more common than is generally realized.

Sarcomata are seen in the nasopharynx from childhood to old age. Sarcomata grow very rapidly and soon fill the nasopharyngeal cavity, producing nasal obstruction, and are apt to invade the paranasal sinuses. Carcinomata originate from the side wall of the nasopharynx, especially from Rosemuller's fossa, and do not grow into the nasopharyngeal cavity until late, therefore they do not produce nasal obstruction, but infiltrate the neighboring organs. As the Eustachian tube is the most superficially located organ found in this region, the first symptoms produced by a nasopharyngeal carcinoma are disturbance of hearing, and pain in the ear and mastoid. If patients over thirty years of age present themselves with middle ear catarrh, otalgia and mastoid pain, without visible evidence of inflammation of the middle ear, most especially if there is hemorrhage from the throat, carcinoma and lymphosarcoma of the nasopharynx should be suspected. Such symptoms as pain in the eye, trifacial neuralgia, paralysis of the corresponding half of the palate, tongue, pharynx, larynx, and the sternocleidomastoid and the trapezius muscles may manifest themselves, and all these symptoms may occur in patients without any nasal obstruction, and before there is any hemorrhage in the throat. Therefore, such patients may have numerous examinations without a correct diagnosis, unless a routine examination of the nasopharynx is made.

Sarcoma of the pharynx may begin in any portion of the pharyngeal wall, but the tonsil is the most common site. Lymphosarcoma of the tonsil is most frequent during middle life, though it may occur in childhood. Sarcoma of the tonsil is frequently assumed to be an enlarged tonsil and a tonsilectomy is done only to have the fossa rapidly fill with sarcomatous tissue. The unilateral location, lobulated appearance and thickened mucous membrane will aid in identification, though the growth is not always distinctive.

Enlarged cervical glands are not an early manifestation, except in lymphosarcoma, which is always marked by an enlargement of the cervical glands, often with no symptoms pointing to the nasopharynx. It might be well to mention in this connection that some well known authorities believe that Hodgkin's disease, lymphosarcoma and lymphatic leukemia, all have a common neoplastic cellular origin.

The investigation of cancer when it attacks the larynx, is particularly interesting; for, as McBride says, the early diagnosis of cancer of the larynx is the pearl of great price in the treatment of this disease. In the intrinsic form it offers every promise, almost a certainty of a cure. In the extrinsic form

it is the chief hope.

In cancer of the larynx, chronic irritation, excessive use of the voice, and the abuse of alcohol and tobacco are generally listed as predisposing causes without any definite proof. Jackson believes that the abuse of the voice is one of the commonest causes of chronic laryngitis, keratoses, papillomas and granulomas, which form a favorable soil for the development of cancer. If this were true, it might be expected that laryngeal cancer would be a common disease; whereas it is relatively rare and about ten times more frequent in men than women. However, it is believed by most authorities that cancer rarely, if ever, appears in a previously normal larynx. Furthermore, research shows there is no proof that benign growths have any special liability to undergo malignant degeneration, even after intra-laryngeal operations. Some authorities challenge this opinion. Nevertheless, we must pay respect to the conclusions of Semon that benign growths rarely, if ever, become malignant.

Intrinsic cancer is the most common manifestation of malignant disease of the larynx, which, in the great majority of cases, first attacks the vocal cord, so much so that it is called cordal cancer. For a long time the only symptom is hoarseness usually showing itself by a little voice fatigue at the end of the day. This huskiness may be dated from a sore throat, a cold; and is often attributed to excessive smoking or abuse of the voice. This voice change in sensitive and observant patients may be so insidious that neither the patient nor his friends can be positive about the date of commencement. It is important to note that, for many months there is no pain, no cough, no dysphagia, and no complaint, beside a change of voice. This hoarseness comes to be regarded as chronic, harmless and negligible, by the patient, his friends and even his medical adviser. This huskiness or hoarseness may continue for months or even years before the patient presents himself to the laryngologist. We may say in the first stage of malignancy of the larynx there are no symptoms besides alteration of voice, and possibly some local discomfort. In the second stage hoarseness increases and dyspnea on exertion with stridor are gradually added. Still the patient may maintain his usual health and sense of well being. In the third stage certain text-books still describe such symptoms as dysphagia, hemorrhage, salivation, glandular infiltration and cachexia, which, generally, only indicate a late and hopeless state of the disease.

Epithelioma in the larynx may occur on the surface of any part of a cord except the two extremities. There may be only a point of persistent congestion with some thickening



of the cord. Careful comparison with the opposite cord shows that the affected one has lost its outline and flat, ribbon-like surface. If the surface is irregular or develops discrete white spots, suspicion of its malignant nature should be aroused. In fact, any unilateral cordal condition should be regarded as suspicious. Impaired mobility of the cord is not an early symptom. Hoarseness may be present and a cordal tumor may be visible for months before the movement of the cord is affected. Free mobility of the cord is no evidence that a growth is not malignant. When immobility exists it indicates a comparatively advanced and not an early growth. As immobility is not an early symptom it should be our ambition to have made a diagnosis before its appearance.

Subglottic cancer requires careful study. It no doubt will explain some cases with obscure throat symptoms, such as paresis of one cord. Alteration of the voice is not necessarily an early or noticeable symptom of subglottic cancer. There are no general symptoms. The patient may first complain of difficulty of expelling mucus from the larynx. Two indications, which should be emphasized, both neglected by the public and profession, are gradual onset of slight dyspnoea and stridor on exertion.

Extrinsic cancer originates on the margin of the epiglottis, the posterior surface of the ary-epiglottic fold, the arytenoids and the interarytenoid fold, the posterior surface of the cricoid plate and the sinus pyriformis. The symptoms of extrinsic cancer, in contradistinction to those of the intrinsic variety, are insidious, vague and uncertain. Before the patient has had any warning of the presence of a growth, the tumor is no longer sharply circumscribed and may have invaded the glands.

As the symptoms of intrinsic cancer are chiefly concerned with the voice and respiration, so those of the extrinsic class are primarily concerned with deglutition. Pain is usually unilateral and radiates to the jaw or ear on the same side and is increased on swallowing. The passage of food occasionally gives relief, while the swallowing of mere saliva will cause agony. In our haste to examine the interior of the larynx, physical signs are often overlooked. It is very important to view the epiglottis both during quiet respiration and on high phonation, for it is on phonation that the sinus pyriformis opens out and can best be examined. If the sinus pyriformis is occupied with frothy mucus, which quickly reaccumulates after being washed away by swallowing a sip of water, while the sinus on the other side remains free, suspicion of cancer should be

aroused. A more frequent use of the modern directoscope and laryngoscope will assist in making a much needed early diagnosis in these cases, for an early diagnosis of the extrinsic variety is of paramount importance.

A tubercular lesion in the larynx is more frequently mistaken for a cancer than any other condition. The laryngeal image in which a pallor and edematous swelling of the arytenoids and the interarytenoid space, in connection with the patient's temperature, weight, fatigue, physical signs, X-ray, Blood and sputum, should assist us greatly in making a differential diagnosis. If the case is seen in the incipient stage, there is no need to be in haste to arrive at a diagnosis, if there is doubt as to which of the two conditions is present. To submit hastily a tubercular larynx to a laryngofissure would be a serious error. Removing a portion of a laryngeal neoplasm for diagnostic purposes is no doubt of great value, but authorities agree that it should not be resorted to in cases suspected to be cancer, unless the patient has consented to have an operation performed immediately, should the diagnosis prove the presence of cancer.

Laryngeal syphilis is nearly always accompanied by other evidence of syphilis, such as skin lesions, ulceration or perforation of the nasal septum or palate. One distinguishing feature is that ulceration of the larynx in syphilis is more rapid than in cancer. Syphilis, tuberculosis, and cancer may all occur in the same patient, so the difficulty of the diagnosis is self evident.

In closing, it should be emphasized again that the approach to the study of cancer is involved and covers a great deal of territory. No doubt there are many defects, yet the discovery of them will serve to strengthen the argument and increase whatever value there may be in it. It is an interesting field and even those tenets which are wrong may suggest something of use to some one else.

The attempt to correlate the allied sciences and apply them to the evolution and cellular life of man has been very stimulating, since it appears to show more intimately how and why things take place. After review and reflection it becomes more explanatory and seems to offer a promising field of investigation.

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**Toxin of *Bacillus Welchii* in Toxemia of Acute Intestinal Obstruction.**—Thurston failed to elicit any evidence that toxins of *B. welchii* are a factor in the toxemia of acute intestinal obstruction.



## AN UNUSUAL GENERAL CONDITION WITH FIRST SYMPTOMS APPEAR- ING IN THE EYE\*

CHARLES K. BECK, M. D.

Louisville.

February 22, 1930, a little girl eight years of age was referred to me by one of my patients. She was complaining of right facial paralysis. I could find no pathology except chronically infected tonsils, adenoids and cervical adenitis. Accordingly February 26, I removed her tonsils and adenoids. In a few days the paralysis had entirely cleared up and never returned.

March 15, 1930, she returned with the complaint that her sight was failing. Another eye physician in Louisville had seen her on January 11, 1930, at which time he prescribed glasses. She stated there was some immediate improvement in vision but that she still could not see very much. She wanted to see if she could be helped still more. She was wearing O. D. + .25 + 2.00 x 30 O. S. + 25 + 2.00 x 135. Her vision with this correction was 20-200 with each eye. Ophthalmometer readings were O. D. 2.75 x 90, O. S. 2.25 x 105. Under hematropin I was unable to get any improvement. Retinoscopy was unsatisfactory because she was unable to fix but I got O. D. at 90 + 5.00 and at 180-1.25, O. S. at 90 + 4.50, 180-1.25.

Ophthalmoscopy revealed what looked to me like granulated honey all around both discs. It extended out from both discs in all directions as much as two disc diameters. The retinal vessels could be seen crossing the white area but no choroidal vessels. The periphery of the retina appeared normal. There was no nystagmus but she could not fix, making examination a little unsatisfactory.

I phoned the eye physician who had seen her in January and he said she had had no trouble like that at that time. So I sent her to him for reexamination. He reported this trouble had developed since he had seen her in January and he thought it chorioretinitis. Drs. Shafer, Pfingst and Wolf saw her at my request and concurred in the diagnosis and treatment. Wassermann was negative. Urinalysis was negative except Sp. Gr. 1007, reaction neutral and sero-albumen one plus.

On March 19, 1930, she was given 0.15 gms. Neo Arsphenamine and injections of Ungt. Hydrang. were started. March 25th, she was given 0.3 Neo Arsphenamine; April 1st, 0.15; April 15th, 0.15. She was later given Pot. Iodid. On April 15th, her vision with cor-

rection was 20/100 with each eye, but there was never any further improvement. Dr. R. I. Kerr, was her physician at this time. He reported increasing amounts of albumen in her urine and we thought it best to discontinue antileptic treatment for a time.

About this time her mother told me that she had severe attacks of headache accompanied by persistent vomiting. The attacks would last two or three days or a week. They had started when she was five or six years of age and had gotten steadily worse. At first she had them seldom but now they occurred about once a month. They were not associated with constipation or indiscretions in diet.

Her mother also told me about this time that when she first started to school she studied and was very much interested and seemed to have no trouble with her vision until the beginning of school in the fall of 1929.

During the summer of 1930 she was in occasionally for observation. There was no appreciable change in her condition in any way until October 25th, at which time I saw traces of several minute retinal hemorrhages.

On November 4th., Dr. Theo. H. Hollinshead who was the physician in charge at this time, referred her to Keith, Keith & Bell for x-ray of the skull.

They report as follows:

"Stereoscopic films of the skull made in both lateral positions and in postero-anterior and antero-posterior positions show the suture lines to be unusually prominent. This is suggestive of slight separation, a finding frequently seen in the presence of increased intra-cranial pressure. The convolutional markings are also moderately prominent. This too is suggestive of increased intra-cranial pressure, although in a child it may be present and have no apparent significance. The sella turcica is normal in both its size and outline. The clinoids are sharply defined and the base is very satisfactorily shown. Nothing suggesting a pituitary adenoma is noted. There are no shadows above the sella suggestive of a supra-sellar cyst. The blood vessels are normal. No unusual areas of calcification are seen. The mastoids are very satisfactorily visualized and are normal. Nothing else of importance is seen. The sinuses are quite satisfactorily shown, although the films were not made for this special purpose. They appear to be clear.

The general appearance of this skull is quite suggestive of the presence of an increased intra-cranial pressure. There are a number of reasons for increased pressure. One of these is, any type of tumor pressing on some part of the ventricular system and obstructing it."

\*Read before the Eye, Ear, Nose and Throat Section of the Kentucky State Medical Association at Lexington, September 7, 1931.

Though I saw her several times after October 25th, there were no changes noted until December 24th. Her mother called me saying that she had had one of her headaches accompanied by vomiting and that her left eye was very red. From her description I judged it to be an episcleral hemorrhage and suggested a simple remedy as she thought it unnecessary for me to see her. Dr. Hollinshead advised her on the 26th to call me to see the eye. I found such a large amount of conjunctival edema present that I was unable to see the globe. The next morning blood was oozing in droplets through the distended conjunctiva. I had never seen anything behave just like this, so I requested consultation. Dr. Pfingst was chosen and saw her with me in the afternoon. By this time a drying exagulum had formed in the palpebral fissure. The orbital contents were enormously swollen. A diagnosis was impossible.

On December 28th, I removed a large blood clot from the eye at which time I saw what I thought either a piece of the cornea or a white blood clot. Her clotting time was six minutes, hemoglobin 73%. I gave her ten cc normal horse serum subcutaneously because the hemorrhage continued. After this there was less loss of blood until January 9th. Urinalysis December 31st. Reaction, acid; Sp. Gr. 1010; occasional pus cell, quite a number of red blood cells; and sero-albumen two plus.

All consultants feeling that this might be a cancerous condition, she was again referred January 3rd, to Keith, Keith & Bell for another x-ray of the skull.

The following was reported:

Postero-anterior stereoscopic films of the head show no changes in the bone around the left orbit that would suggest destruction from a malignancy of the soft tissue of the orbit. Just anterior to the left orbital cavity and surrounding the external margin of the orbit there are moderately dense soft tissue shadows that may well represent the large hemorrhage of the left orbit.

The nasal accessory sinuses are well developed and well ventilated. Right and left lateral stereoscopic of the head give no additional information. While the films were made with a different x-ray penetration no changes in the bone are seen that would represent a localized destruction or extension of a malignant tumor of the left orbit.

January 9th, eye began bleeding freely again and on the 12th, Dr. Townes and I assisted by the presence and advice of Drs. Pfingst, Hollinshead and Wheeler, did what remained to be done of an evisceration. We found nothing of the globe left except the sclera. A piece of tissue comprising a part of the sclera and the enormously edematous

conjunctiva was removed for microscopic examination. We talked of doing an extenteration but the condition of the patient was such that we were afraid to do so much surgery. She had had a convulsion prior to operation and it looked for a time as though she would not recover.

The pathologist's report was as follows:

Specimen consists of blood clots and fragment of tissue 1/4 x 1 cm. fibrous, pinkish, eye ball not included in tissue.

#### Microscopical:

Sections of tissue. Sections made horizontally show an outer layer of partially denuded epithelial cells, projecting in a more or less papillary arrangement. Epithelial cells oedematous and hyperplastic, but are not infiltrating, beneath is gross hemorrhage, separating fibrous stroma and extending deep into subepithelial tissue are numerous endothelial cells, some forming new blood vessels. Also round cells, a few eosinophiles and neutrophils. Lymph spaces greatly dilated, whole tissue oedematous and very vascular.

Notwithstanding these reports we feared malignancy and accordingly on the 16th, radium 50 mg., well screened was applied to the left orbit laterally. The next day the position was changed to the front and was removed at 8 a. m. on the 18th, making exposure of twenty-eight and one half hours.

Temperature, pulse and respiration chart during the six days in the hospital is attached. There was no further hemorrhage from the left eye. The edema gradually subsided until there was very little left. On February 4th, she began to bleed from the gums and bled for 48 hours. Hemorrhage from the kidneys and bowels followed.

On February 7th, the right eye began just as the left and acted in the same manner. The condition of the patient was such that operation was out of the question.

On March 11th, she had one of her headaches and vomiting spells lasting 36 hours. Some blood was vomited.

She died March 12th, almost a year after the condition in her eyes was first seen.

#### DISCUSSION

**Adolph O. Pfingst, Louisville:** Mr. Chairmen and Gentlemen: Undoubtedly this has been the most unusual and interesting case that I have ever seen since I have been practicing medicine.

All of us have seen a great many cases that we could not diagnose clinically. In this case we not only failed to make a diagnosis before operation but even after operating we were unable to come to a conclusion as to the nature of the disease and even after autopsy the prevailing pathology, especially as it applied to the eyes was difficult of interpretation.

I will try to be brief and will endeavor not to repeat what the other two speakers have said.



My connection with this case dates from March of 1929. Following the prerogative of the medical profession I would differ somewhat with Dr. Beck as to the findings at that time. It seemed to me when I saw her then (that was a year before the severe symptoms came up) that this child presented the typical picture of a disseminated choroiditis in both eyes. There were quite a number of atrophic areas with pigmented edges. I attached no special significance to these choroidal changes as they would have a bearing on the more recent pathology which took place in the edges. Vision at the time I saw this child in 1929 to 20/200 in each eye. There was atrophy of both nerves. At that time the child was put on mercurial treatment, as is customary in such choroidal troubles even though there are no evidences of lues. I did not see the case again until last year when Dr. Beck was kind enough to let me study the case with him after the appearance of the obscure symptoms which he described.

It was a pathetic case right from the start. This was an only child. When I entered the front room of the small cottage on the 26th of December there was a Christmas tree prettily decorated and surrounded by the child's playthings and the child was in the next room suffering with nausea and headaches. The first thing that presented itself was an extensive swelling of the left orbit. Some of you have no doubt seen large hematomata following enucleation and after injuries. In this case the lid was tense and partly covered a large hematoma—perhaps as large as a walnut. The cornea was entirely covered by a mass of clotted blood protruding between the discolored tense lids and a sanguinous fluid exuded from around the mass. Our first idea was there was some blood dyscrasia in the case that caused the hemorrhage but as Dr. Beck has explained to you the blood count was normal in every way. The blood clotting time was normal, the blood clotting in five minutes. We also considered the question of a thrombus of the cavernous sinus but thought that we could exclude this in the clinical course of the case. The thought then occurred to us that there was probably some underlying malignancy, that this accounted for the severe headaches which had persisted for some time. There was a history of occasional headaches two years prior to this present illness, but as the change in glasses was always followed by relief we did not attach any importance to these early headaches. The severe headaches associated with nausea, which evidently were part of the final illness appeared about the time Dr. Beck was called in early in the year of 1930. As the doctor told you, upon operation we didn't find anything that threw any light on the case even after we got all the clot of blood away. In that blood we found a few gelatinous masses that proved to be small fragments of corneal structure. After removing

the clotted blood a cup of sclera remained as you would find it after evisceration of the eye balls.

When the second eye started we were more at sea than ever and were helpless as far as instituting treatment was concerned. During the time of the trouble with the left eye we found no active changes in the fundus of the right eye. It presented the same picture that it did a year previously. We still had the old choroidal spots, but no signs to indicate intracranial pressure. The necropsy, as the doctor has told you, was most interesting. I have seen some of these specimens and they are very beautiful and show how parts supplied by such obstructed vessels could suffer for want of nourishment.

As far as my own opinion is concerned, I would say that the fundus changes noted in 1929 had nothing to do at all with this present trouble, which began in December. I take it from the kind of vessels that Dr. Miller found in his very exhaustive study of this case, that the vessels underwent the same changes in the anterior termination of the sclera near the cornea that he noted in nearly every tissue of the body and that there were obstructive changes in the anterior ciliary vessels, causing nutrition to be cut off from the cornea finally terminating in a sloughing off of this structure. It seems from everything that Dr. Beck could find out from the family that the first changes in the eye resembled subconjunctival hemorrhage and that this rapidly became larger and larger until it formed a large hematoma so that finally you could not see the cornea.

As regards the other conditions I don't believe that the vessel changes were the primary cause of death of this child but like the other speakers, I believe that death was caused by intracranial infection probably from the middle ear. It was fortunate that something did intervene to relieve this child of its suffering.

**Acromegaly and Megacolon Due to Tumor of Hypophysis.**—Carnot reports the clinical history of a man, aged 43, who had chronic, persistent constipation and occasional headache. Symptoms of acromegaly had been noted during the previous ten years, but he had no severe or localized pain. Roentgen examination showed that there was a marked enlargement of the sella turcica, indicating a tumor of the hypophysis. This was likewise demonstrated by alteration of the optic chiasm. Although there was only a slight disturbance of vision, the acuity was unimpaired. The intestinal stasis was accompanied by enlargement of the viscera. Examination showed an enlarged and especially and elongated colon. On the basis of a review of the literature, Carnot points out that the symptoms found in this patient support the theory of a relation between tumors of the hypophysis, acromegaly and enlargement of the viscera.

# OSTEOMYELITIS COMPLICATING THE FRONTAL SINUSES AND SINUS THROMBOSIS\*

A. L. Bass, M. D.

Louisville.

Case I. M. L. D., Age 14. Appeared in my office August 7th, 1926, with the following history: Mother, living and well; age 49, father, living and well; age 53, one sister, living and well; age 23, one brother, living and well; age 12.

Past History: Had measles, age three. Pertussis, age six, and chicken pox, age eight; without any complications.

Present History: Has been going in the ocean up East for several days. Four days ago noticed a swelling of left upper lid; no pain.

Examination: Left upper lid edematous, protruding over lower lid. Left eye shut, and with some difficulty after pulling down on the lower lid and making sufficient traction on the upper lid I was able to see the eye was negative. Intra-nasally, the mucous membrane was congested; there was a creamy pus underneath the anterior tip of the left middle turbinate. Temperature was 103.4. X-ray showed cloudy left frontal, ethmoid and antrum.

Diagnosis: Acute infected frontal, ethmoid and antrum, left side. Smear from pus in nose, staphylococcus.

Treatment: Local, plus suction; warm magnesium sulphate compresses twenty minutes every three hours; metaphen 1-5000 solution, t. i. d. intra-nasally. August 8th, treatment, locally in office. Temperature 101.2. Urine Acid 65, Solids 55, Albumen, present.

August 9th, temperature 104. Patient was sent to hospital, where under anesthesia left ethmoid area was exenterated intra-nasally, anterior tip of left inferior turbinate was excised and intra-nasal opening made in left antrum. Antrum and left ethmoid area were packed lightly with 5% iodoform gauze. Left upper lid was incised and about two drams of pus was present. Drain was left in incision. Her blood count at this time was W. B. C. 11,650, polys 81, lymphocytes 19.

August 10th, temperature 101. August 11th, packs and drain removed. Laboratory report of sinus pus was staphylococcus. Warm saline compresses externally twenty minutes t. i. d. to left eye and antiseptic drops intra-nasally were used and the patient was discharged from the hospital August 16th, seven

days after admission. Temperature normal. Her blood count at this time was W. B. C. 7,900, polys, 68, lymphs, 32.

Patient was seen August 23rd in office apparently doing well. On August 26th left upper lid became swollen again and on August 29th, it was incised at home. Patient came to office August 31st, September 3rd, and on September 6th, I noticed a slight swelling along upper margin of orbit and decided to have another x-ray made which showed an osteomyelitis of frontal bone, as you will notice in the picture along upper margin of orbit extending into center of forehead. Upon viewing the X-ray at this time, I thought, it won't be long before we will need the undertaker, and informed the parents that the prognosis was very bad. Temperature had been going along about normal and at this time it was 99.4. The patient was sent back to the hospital and the next day an incision was made along margin of orbit, the necrotic area was curetted away, and another incision was made over necrotic area in center of forehead; area curetted and a rubber tube through and through connecting this incision with one at margin of orbit was inserted. A rubber tube was left in the naso-frontal duct.

I left town the next day to attend the Academy meeting in Colorado Springs; not having the slightest idea that my patient would be alive and doing well upon my return October 12th, over four weeks later. I left her in charge of my associate, Dr. Richeson, who kept me posted as to her condition. During my absence she had very little done save dressings changed. Tube removed from naso-frontal duct about the tenth day; and tube removed from fronto-orbital incisions at the end of the third week. There was a fistula in the forehead wound and a sequestrum could be felt with probe. Under light anesthesia, the sequestrum was removed in her home, and after a few days fistula closed.

The main reason for reporting this case is, the treatment is contrary to the general consensus of opinion; that is, you have to go wide of the area of involvement if you hope to stop the extension of the osteomyelitis.

Case II. Is a lateral sinus involvement with the following history: Mrs. L. H., age 27, seen April 22, 1927. Mother died age 41, with mastoiditis, father died age 59, with acute indigestion, sisters, four, living and well, brothers, four, living and well.

Personal History: Measles age 8, no complications. Had ear ache several times during childhood; doesn't recall having any discharge from ears. Tonsils and adenoids removed age 12. Has had four children.

\*Read before the Eye, Ear, Nose and Throat Section of the Kentucky State Medical Association at Lexington, September 7, 1931.



One child died age eleven months from intestinal trouble.

June 26, 1921, had pain in left ear one evening; drum ruptured during night with ease of pain and the next morning she noticed blood on pillow. Three days later she went to a physician, who had an x-ray made. On July 2, 1921, six days after onset of symptoms, a simple mastoid was done. She was in hospital fifteen days.

Present History: Two days ago, left ear began to discharge. Has pain in left temple and left side of neck.

Examination: Left drum had perforation posterior inferior with pulsating discharge with odor. Smear, everything. No tenderness over mastoid area. Temperature, normal.

Diagnosis: Exacerbation otitis media purulent catarrhal.

Treatment: Boric Acid irrigations, followed by boric acid alcohol "drops" into left canal twice daily. Neo-silvol 15% solution instilled into nose twice daily. April 26th treatment, discharge less, temperature normal. May 2nd, treatment, very little discharge. She was told to continue her irrigations followed by alcohol "drops" for a few days and return if she did not get along all right.

She was not seen until March 13th, 1928, when she came to office complaining of discharge for the last few days and would be dizzy at times.

Examination at this time: Sinuses transilluminated negative. Temperature normal. Left canal presented chronic purulent discharge as before without pulsation.

Treatment: Irrigation, bichloride 1-5000 solution, twice daily; followed by alcohol "drops," plus neo-silvol 15% solution into nose. She was seen March 25th and 31st, when there was slight discharge.

She was not seen again for about two years, when on July 1, 1930, she came in complaining of being dizzy for a while after getting up in mornings.

Examination: Left canal congested, swollen, filled with chronic purulent discharge. Temperature 99.8; slight tenderness on pressure over mastoid area. Urinalysis: Acid 30, 1020, Solids 44, indican, two plus.

Treatment: She was advised to have radical mastoid operation. One half inch 5% Iodoform gauze wicks were used in external auditory canal by patient; being changed several times per day, according to the amount of secretion. This was the treatment while she was making up her mind to have the operation done, which was performed on July 18th, seventeen days later. At this time she had a small fistula through old mastoid incision.

Blood count, R. B. C. 3,970,000. W. B. C. 9,600, Urinalysis; Acid, 1008, Albumen, trace.

Operation: Old mastoid area was filled with necrotic material which was removed. Posterior canal wall was taken down, bridge removed, external attic wall curetted and facial ridge was taken down to the level of the horizontal semicircular canal; malleus and incus removed, middle ear cavity cleaned up, eustachian tube curetted, "T" shaped flap made in membranous posterior canal wall and cartilage removed from flap; tip sutured to temporal muscle superiorly and lower tip to soft tissues inferiorly. Canal was packed with 5% Iodoform gauze which was removed on the fourth day. The wound was given the usual after care and did well. For some time after the operation she complained of a dull continuous pain just above external auditory canal, which finally subsided.

On November 11th, about four months after radical operation, she became dizzy and fell down some steps at home. November 14th a blood culture was made which showed staphylococcus aureus on seventh day. R. B. C., 4,400,000 W. B. C. 8,800 eosinophiles .1, staff 4, lymphs, 27 neutrophiles 3.

The blood count being normal I did not consider seriously the blood culture being positive on the seventh day. There was a recess from her cares of about three weeks when she came to office January 7th, 1931, complaining of pain in left cheek following a "cold" for a few days. Left antrum transilluminated dark and irrigated pus. The antrum cleared up after six irrigations of two to four day intervals.

On January 30th she came to office complaining of pain at tip of mastoid, left side. Temperature 100. There was a slight congestion over tip; tender on pressure. She was sent to Dr. Franklin Jelsma for a Queckenstedt test. With the water manometer the pressure was 140; with pressure on left internal jugular pressure was 150; with pressure on right jugular pressure registered 290. Spinal fluid showed one cell per c. m. No globulin increase. Examination for brain tumor negative. With this evidence in hand, I told her husband I felt that his wife had an obstruction in the left lateral sinus and should have her internal jugular resected and lateral sinus obliterated. At this time he told me when she had her simple mastoid operation she ran a temperature of 108 for two or three days.

Laboratory work at this time showed, R. B. C. 3,650,000, W. B. C. 7,500, Urinalysis, Acid, 1011, negative.

Left internal jugular was resected, ligation including facial vein entrance. The wound was closed save for a small rubber tissue

drain in lower end of incision. Sinus was then exposed for about one and one-fourth inches, incised while pressure was made at each end of exposed sinus; free bleeding was obtained towards the torcular, the sinus was obliterated with rolled 5% Iodoform gauze and dressing applied with fairly taut bandage.

The packing was removed on the fifth day. During convalescence patient's temperature did not go over 100.4 and this was within the first few days after the operation. Patient left hospital February 19th, seventeen days after operation, with pulse 76, temperature 98.2 and respiration 18.

#### DISCUSSION

**D. M. Griffith, Owensboro:** Dr. Bass is to be congratulated upon the outcome of his cases. I think in the discussion of the papers it is intended that we express our opinions even though they are at variance with those of the essayist; otherwise our society would bring us no real information.

There is no question but that he was compelled to do an operation upon his frontal for osteomyelitis. I am not just in accord with him in exenterating the ethmoid. I don't believe I would want my ethmoid exenterated under a general anesthetic. There are so many recesses and pockets it is almost impossible to reach them, and I would much prefer a more conservative procedure. I think to amputate the anterior and middle turbinate and get drainage there, which you must do before any external operation is going to be successful, is a far more desirable course. My own practice is not to remove the anterior end of the inferior turbinate in draining the antrum, when I have found patients so greatly troubled with discharge coming out of the nose.

I do want to commend him upon the splendid result of the external operation. As regards the point he brings out about it being at variance with the accepted treatment, in that he did not go to the extreme boundary of the involvement of the bony structure, I think that is always good surgery. We become so very radical that sometimes we take out a whole lot of healthy tissue that could be left, an area that would be revitalized if we didn't go to such extensive destruction.

Twenty years ago a radical operation was the rule. A period following that bordered onto conservatism that became almost extreme. Somewhere between there is a boundary of moderation that I think must be determined by the condition of the pathology you have more than anything else. If you had great destruction of the membrane and ossicles and little of the mastoid you would do a radical; contrariwise if you had very little destruction of the drum and the ossicles and very great involvement of the mastoid area, I would, personally, much prefer a complete, simple mastoidectomy, leaving the

wall but making a large opening into the antrum. By complete I mean taking out everything, not only the zygomatic cells, but particularly those cells that lie between the anterior wall of the sinus and the posterior wall of the canal. I have frequently found in secondary operations that that was the source of the continued infection. With a temperature of 100, tenderness especially over the mastoid, and dizziness, I question whether I would want to do a radical. I would want to get some evidence of vertigo possibly caused from some other source. I would want to see if the eye or the heart or the gastro-intestinal tract isn't contributing. I don't believe I would do it on the Queckenstedt test alone, and, by the way, I was rather surprised that the doctor didn't give the pathology in the sinus when he operated on it. He gave us a description of the opening, but he didn't give us just what he found. That is the crux of the whole thing after your operation, as to what you found, not how you found it.

With a temperature of 100 he found a condition that I can't just reconcile to my way of thinking. He said his blood culture was positive, and yet a practically normal white count. My experience has been (and I am sure it is the experience of every man here) that even staphylococcus once it invades the blood stream, gives you a high leucocytoses. I don't think I would want to open up the lateral sinus without finding out some other things, as to whether my patient had headaches, vomiting, and above everything else, two things: a chill and a high temperature and a chill and sweats. Whenever you have a patient in a late stage of any ear involvement, that is prolonged beyond the acute stage, and you get a high temperature, chill and profuse perspiration, you may get very suspicious of lateral sinus involvement. I believe if you take a temperature at sometime or other you get a temperature of more than 100 in cases of lateral sinus trouble. That has been my experience. (Applause).

**G. C. Hall, Louisville:** I want to call attention first in regard to the osteomyelitis. I think if you will look up the cases of osteomyelitis reported you will find that the larger percentage of these cases causing osteomyelitis are due to the staphylococcus.

Regarding the second case of sinus thrombosis, inasmuch as Dr. Griffith dared to differ with the essayist, I want to take exception to what he said in so far as the radical operation is concerned. Had the case been one of acute otitis media I would agree with Dr. Griffith. If you have followed Dr. Bass' case report carefully, you will note that this woman had persistent symptoms over a period of nearly nine years. That is correct is it not, from 1921 to 1930? Under those circumstances and in view of the persistent recurring symptoms showing there was evidently some uncovered pathology in that



ear, together with positive pain, even in the absence of a chill and fever I believe I would have been inclined to follow the course Dr. Bass adopted and do the radical operation, possibly with the uncovering of the sinus, and then if the demonstrable pathology were present in the sinus it certainly would give you license to cut it off from the general blood stream.

I don't attach any importance to staphylococcus appearing in the blood culture after seven days. Staphylococcus grows very readily and very quickly. That evidently was a contamination.

I think the important thing that Dr. Bass did was the radical operation, because it is quite possible from the history he had in obliterating sinus thrombosis at the time of the first mastoid operation, that this condition simply was present there in a latent stage. There was no active sinus thrombosis present then, but certainly he was, I think in view of the persistence of the symptoms and the persistence of the infection, amply justified in doing the operation.

**S. B. Marks**, Lexington: The tendency in all osteomyelitis at the present time is conservatism. Dr. Orr, noted orthopedist, of Omaha, simply opens his cases, packs them with vaseline gauze, and leaves that gauze in there until it falls out. He leaves it in for weeks, and he says if any change takes place a sequestration takes care of it. I think the secret of Dr. Bass' excellent result is that he didn't do much and sequestration took care of what was left. I noticed an article just a few days ago arguing along those lines, and I think reported 3 cases of recovery, in which simple evacuation of the pus was done with opening in the outer table and allowing sequestration to take place, just as orthopedists do in osteomyelitis of long bones.

I was rather interested in Dr. Hall's statement of staphylococcus being the cause in so many instances of osteomyelitis. I have not had much experience with osteomyelitis in head bones, but in the cases when I did general surgery, streptococcus I thought was the predominating organism. You see these very acute cases with one bone attacked and in a few days another bone. I had one case who had 14 or 15 foci of streptococcus osteomyelitis before he recovered.

In regard to the case of the radical operation, I think that Dr. Hall has set forth the facts there very well. I don't really believe he could have done other than a radical operation, and probably, as Dr. Bass set forth too, that patient had thrombosis at the time of her original acute mastoid.

**H. D. Abell**, Paducah: I would like to emphasize the value of the Queckenstedt test as an aid in the diagnosis of Sinus Thrombosis. In my experience this test has been most valuable in differentiating sinus thrombosis from other complications associated with mastoiditis.

A recent case we have just seen, brought out a finding which I think is worth mentioning. The manifestation which I refer to is marked decrease in respiration. For 48 hours before the patient had a ligation of the internal jugular vein, the respiration was around 12 per minute and at one time, probably an hour before operation, the respiration dropped to 6 per minute. The Queckenstedt test on this patient was positive and after ligating the vein below and removing the clot above, the patient made an uneventful recovery.

**A. L. Bass**, (In closing): I want to thank the gentlemen for their discussions.

In reference to exenteration of the ethmoid, I felt I couldn't get sufficient drainage unless I did. I might have curetted out the ethmoid and left the middle turbinate but I felt that something radical had to be done. As far as removing the anterior tip of the left inferior turbinate, I don't do that if I can get out of it. Of course, I don't like to open up any more avenues than necessary.

I have a case similar to this under observation, which is going through practically the same thing, that I left the anterior tip of the left inferior turbinate. I got sufficient opening in the antrum without removing it. Dr. Ross Skillern made the statement that in these osteomyelitis cases of the frontal bones, they are either diffuse or circumscribed and if diffuse you might as well go out and play golf because no matter what you do for them they are going to die. If they are circumscribed just give them a little drainage, and give nature a chance to wall off the avenues of infection which she will do in a good many instances if we just give her a chance. I feel this was just a localized condition, circumscribed rather than diffused was the reason she made the "grade."

Dr. Hastings reported two cases, one of them osteomyelitis of the frontal bone complicating acute sinus infection in which he made a small opening and inserted a rubber tube and let nature take her course and the patient got well. In another case of acute osteomyelitis of frontal bone with local treatment for two or three months the case cleared up.

Relative to the radical versus the simple, many times if it is sufficient I do the simple, especially in a youngster where you clean them out good and leave a great big antrum. I think in a good many of those instances instead of doing a radical if we would do a good simple it would take care of it.

I had a case reported before the Jefferson County Medical Society a few years ago. This patient had had an acute polyp removed about a year before at Ford Hospital in Detroit and his tonsils out. He had been in bed for about two months. There was no complaint except that he didn't feel like doing anything. He had a blood count of about 16,000. It looked like it

called for a radical. I did a radical on him, and on about the fourth or fifth day he "broke loose" with a cavernous sinus thrombosis. I thought about this case when this lady kept "showing up." What happened was when I did the radical I loosened the thrombus in the lateral sinus which had been present for some time.

Some of these people go along for years with sinus thrombosis and nature takes care of it. His blood culture was negative, so I felt if he had a clot there it was sterile.

I felt justified in doing this. I didn't get any clot, but I got free bleeding from each side, which I felt would relieve the headaches. We don't always find clots, especially in acute conditions, but I felt satisfied there was some obstruction somewhere.

### THE CROSS CYLINDER AS AN AID IN REFRACTION\*

R. H. COWLEY, M. D.

Berea.

In 1923 there was an article in the *Journal of Ophthalmology* by Dr. Crisp of Denver which was beautifully illustrated to show visually just how the cross cylinder is used and what the patient sees as he looks through it. The article was splendidly conceived and written, but it went into such minute detail that most of those who read it, so far as I can learn, failed utterly to catch the idea of its simplicity and practical usefulness.

Last summer I went to Denver to take the course which the Colorado Society offers every year, and while we were there Dr. Crisp demonstrated to us in small groups the simple technique of its use. One needs to have it demonstrated on one's self to really get the idea. I happen to have a diopter and a half of myopic astigmatism and when he demonstrated it on me I saw at once the wonderful possibilities of the procedure.

I came home and after using it for several months and finding how really helpful it was it seemed to me that it was my duty to see that every eye man in the state had an opportunity of learning the method. Of course, I had and have no way of knowing how many are already using the method, but from what I could find out, I concluded that there were very few. The fact that I know less about eyes than many of the men in my audience does not lessen my responsibility for sharing with you any new method which I may have been fortunate enough to pick up.

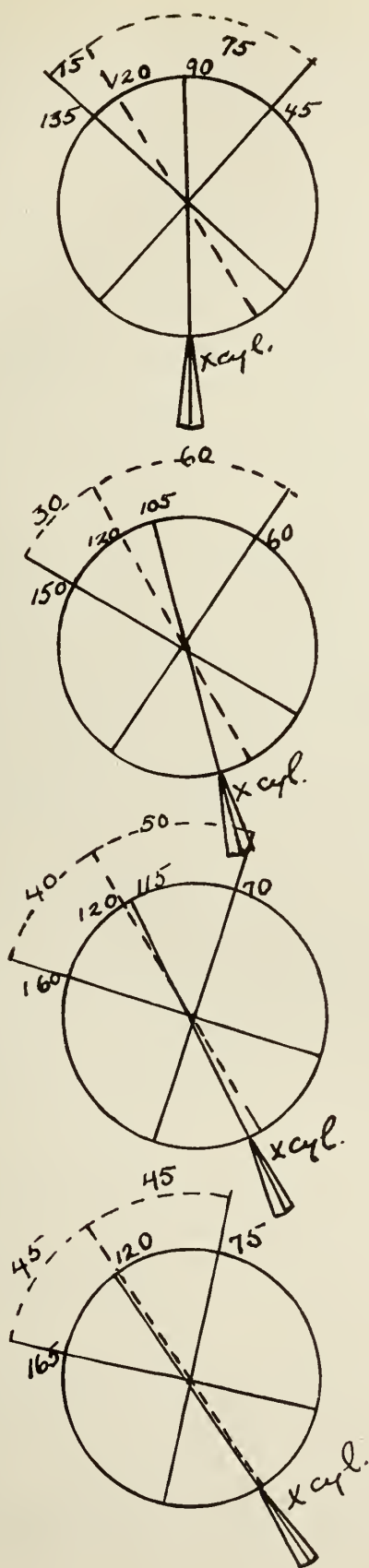
As the demonstration is the important part

of the subject, I am not going to read a paper, but I have prepared some notes and ran them through a ditto machine. These you have in your hands so that you will not have to take notes. All I ask of you is that you try to stay awake. I have rigged up a small lantern to show you just how the letters look to the patient as the cross cylinder is used. If any of you are sufficiently interested I shall be glad to demonstrate it to you personally if we can arrange a time. If you have not astigmatism we can make you astigmatic for the test by placing a minus cylinder before your eyes.

The first question to answer is what is the cross cylinder? It consists of a lens ground with a minus sphere on one side and a plus cylinder of twice the strength on the other side. The one most commonly used has a minus 25 sphere on one side and a plus 50 cylinder on the other. This gives us a plus 25 cylinder in one axis and a minus 25 cylinder in the opposite axis. Thus if the plus 25 cylinder is at 90 the minus 25 cylinder will be at 180. The handle is placed just half way between these axes or just 45 degrees from each. It is easy to see that when the cross cylinder is rotated on the handle the plus and minus cylinders change places so that if the plus cylinder is placed at 90 and the instrument is rotated on its handle the plus will go to 180 and the minus will go to 90. In order to function properly the instrument must be exactly constructed. The handle must be at exactly 45 degrees to the axis. It may seem foolish to stress that point, but we were warned by Dr. Crisp to be careful to test out our instruments when we bought them, and out of the three that I have bought two were incorrect. To test the instrument hold it rigidly with the left hand, with one axis in line with the side of a door casing. Rotate it with the right hand and if the line of the door makes a continuous straight line with both axes as they are rotated the instrument is properly mounted. As the handle is rather delicate and may get bent, it is wise to test it out occasionally to see that it is plumb. The American Optical Co. makes two kinds, one with this small handle and one with a thick handle. I much prefer this small one, as it is so much more easily and delicately manipulated.

\*Read before the Eye, Ear, Nose and Throat Section of the Kentucky State Medical Association at Lexington, September 7, 1931.





These two diagrams illustrate the contrast one gets by rotating the cross cylinder on the handle which is set at exactly 45 degrees to the axis of the two cylinders. When the plus 25 is vertical the total plus cylinder in this axis is 50 for the minus 25 cylinder in axis 180 is equal to minus 25 sphere plus 25 cylinder axis 90. When the cross cylinder is reversed and the minus 25 cylinder is vertical the total minus cylinder in this axis is minus 50 for the plus 25 cylinder, which is now in axis 180 is equal to plus 25 sphere minus 25 cylinder axis 90. Thus by reversing the 25 cross cylinder we get a contrast of a full diopter.

The cross cylinder is used for two purposes, to find the amount of the astigmatism and to locate the axis.

In testing for the amount of the astigmatism we place the axis of the cross cylinder with the axis of the cylinder in the trial frame.

In testing for the axis of the astigmatism we place the handle of the cross cylinder in line with or at right angles to the axis of the cylinder in the trial frame.

When we are working on a plus astigmatism we pay attention to the plus axis of the cross cylinder only and vice versa.

Now let us go through the steps of finding the amount of astigmatism in an eye. From the retinoscopic or ophthalmometric examination we think we have a plus astigmatism of about 75 axis 90. We place the cross cylinder before the eye with the plus axis at 90. The value of the cylinder in this axis is now plus 50, or 25 below the amount of the astigmatism in the eye. We now reverse the cross cylinder, bringing the minus cylinder to 90, and the total value of the cylinder in this axis is now minus 50, or 125 below that of the eye. Obviously the patient will see the print much more clearly with the plus cylinder in axis 90, so we place in the trial frame a plus cylinder of say 50 and try again. We again place the cross cylinder before the eye with the plus axis at 90, and now we have in axis 90 the plus 50 of the cylinder in the frame plus the 50 of the cross cylinder, or 1.00, which is 25 above the eye's astigmatism. On reversing the cross cylinder and bringing the minus cylinder to axis 90 we have a total value in this axis of the plus 50 of the cylinder in the frame minus the 50 of the cross cylinder, which is zero, or 75 below the eye's astigmatism. The contrast here is from 25 above to 75 below, which is three to one. Obviously again the patient will see best when the plus cylinder is in axis 90. So we raise the cylinder in the trial frame to 62. Again we place the cross cylinder before the eye with the plus axis at 90. We now have in axis 90 the plus 62 of the cylinder in the frame plus the 50 of the cross cylinder 112, which is 37 above

the eye's astigmatism. On reversing the cross cylinder we have in axis 90 the plus 62 of the cylinder in the frame minus the 50 of the cross cylinder or plus 12, which is 62 below the eye's astigmatism. A contrast of two to one even when we are within 12 of the correct amount of the eye's astigmatism. This test is so delicate that we can often determine the eye's astigmatism to be between the strength of the lenses in the trial case.

If because of irregularities or opacities in the cornea or lens or because of a very small pupil which we for some reason do not wish to dilate, we cannot use the retinoscope or ophthalmometer to advantage, and these cases are not infrequent, we may still determine whether or not there is astigmatism present and determine its axis and amount.

We first find whether there is astigmatism present by testing in three positions, at 90, 60 and 30. If with the plus of the cross cylinder placed in each of these three positions and reversed the patient is not able to see that there is any difference in the clearness of the test letters, we may conclude that there is no astigmatism present. For at 90 we test also 180, at 60 we test 150 and at 30 we test 120. Where the vision is very poor we may have to use stronger cross cylinders. I keep a 50 and a 1.00, but seldom use them.

Obviously we must find out whether the astigmatism is plus in one axis or minus in the opposite axis before we try to determine accurately its amount and axis.

The following diagram shows how to locate the axis of the eye's astigmatism. Here we hold the handle of the cross cylinder in line with the axis of the cylinder which we have placed in the trial frame.

We will assume that the astigmatism of the eye to be tested is plus and in axis 120. We will start by placing the cylinder in the trial frame with its axis at 90. If now we hold the cross cylinder with its handle in line with this axis 90 it will bring the plus cylinder in axis 135, which is 15 degrees from the axis of the eye's astigmatism. If now we reverse the cross cylinder it will bring the plus cylinder to axis 45, which is 75 degrees from the axis of the eye's astigmatism, a contrast of 5 to 1. Of course, the patient will see the letters plainer when the plus axis of the cross cylinder is at 135. The trial cylinder is always rotated in the direction in which the patient sees the letters more clearly.

We now rotate our test cylinder in the trial frame toward the axis where it is best seen and place it arbitrarily at 105. We place the cross cylinder with its handle in line with axis 105. This brings the plus axis at 150, or 30 degrees from the axis of the eye's astigmatism. On reversing it the plus axis will be at 60, or 60 degrees from the axis of the

eye's astigmatism. Here we have a contrast of 2 to 1, and the patient will see the letters best with the plus axis of the cross cylinder at 150.

We now rotate our test cylinder in the trial frame toward the axis where it is best seen and place it at 115, which is within 5 degrees of the eye's astigmatism. We now place the cross cylinder with its handle in line with axis 115. This brings the plus of the cross cylinder to axis 160, or 40 degrees from the axis of the eye's astigmatism. On reversing it the plus of the cross cylinder falls at 70, which is 50 degrees from the axis of the eye's astigmatism. Here we have a contrast of 4 to 5, even when we are within 5 degrees of the correct result. This contrast is quite sufficient so that the patient sees the print distinctly better when the plus of the cross cylinder is at 160.

This figure shows how the contrast is reduced to zero when the axis of the cylinder in the trial frame is exactly in the axis of the eye's astigmatism. With the handle of the cross cylinder in line with axis 120 the plus of the cross cylinder is 45 degrees from the axis of the eye's astigmatism, whether it is at 165 or 75. Consequently at this point the patient will see the print equally well or poorly—whichever way the cross cylinder is rotated. When rotating the cross cylinder makes no difference in the distinctness of the print we have found the axis of the eye's astigmatism.

#### ADVANTAGES AND DISADVANTAGES OF THE CROSS CYLINDER TEST

The chief advantage in the use of cross cylinders is the fact that it is a subjective test and therefore depends somewhat on the intelligence and cooperation of the patient. This is a disadvantage which largely disappears as one gets accustomed to using the method. One soon comes to recognize whether the patient is consistent in his answers and cooperative.

It is sometimes difficult to confine the patient to a choice between the two sides of the cross cylinder. They will say they can see better with that thing off. They must be made to understand that the choice is between the two sides of the cross cylinder and not between the lens in the frame and the cross cylinder.

Especially in presbyopes and those with drops in their eyes the spherical correction must be kept checked at the same time that one is testing the astigmatism. One checks the cylinder, then the sphere, then the cylinder until he is sure of his results.

It is sometimes tiresome for the operator, for especially when he is locating the axis the cross cylinder must be held with the han-



dle exactly in line with the axis of the test cylinder in the frame. If it is allowed to wobble around several degrees the result will be correspondingly inaccurate. One must be sure that the cross cylinder is correctly mounted and that the handle has not been bent.

#### ADVANTAGES

The test is invaluable in those not infrequent cases where the eye gets quickly tired when trying to see the letters accurately. In this test it is not necessary for the patient to read the letters. He need only look at them and quickly decide whether reversing the cross cylinder makes any difference in the clearness and blackness of the letters. I usually expose two lines of letters at a time and ask my patient not to try to read the print, but merely to determine if there is a difference when the cross cylinder is reversed. This does not tire the eyes at all.

One is able quickly to detect those rather frequent cases where the ciliary muscle does not contract evenly and the astigmatism changes in amount and axis from day to day and even sometimes from hour to hour. If I am dealing with a case where it is necessary to depend entirely on the cross cylinder for my results I insist on checking it over several times before ordering the lenses. If the patient is from out of town I do the best I can by checking it over several times on the same day, but I prefer having them come back on several different days. I know of no other accurate way to check these cases.

The chief advantage in the method is the fact that it is possible to determine quickly and accurately the amount and axis of the astigmatism in those cases where the irregularity of the cornea, opacities in either lens or cornea or the small size of the pupil make it impossible to come to any conclusion with the ophthalmometer or retinoscope. These are not infrequent cases, especially in cataract and after the operation for cataract. The retinoscopic shadow may be so broken up that it is impossible even to guess at the correction, yet there may be a tiny spot in the very center of vision which can be corrected to give the patient splendid vision. It is especially good where we have the so-called scissors movement.

In illiterates we can test as accurately as with literates.

#### DISCUSSION

**Milton J. Stern, Lexington:** Dr. Cowley demonstrated this over in Berea last fall when I was over there. I read the original article of Dr. Crisp's and I have been using this method ever since. I have always been very well satisfied with it. Dr. Cowley has presented it so well I think with this demonstration there is nothing else necessary to be said to explain it

better.

I have kept records of the cases since we were over there, in an effort to find out how this will check. This is a record of 100 consecutive cycloplegic cases. The amount of astigmatism checked exactly in 40 per cent. An error of 1-8 diopter 11 per cent. An error of 1-4 diopter 32 per cent. Probably if I were sure I could check it within 1-8 diopter I think I would have more in the eighth column than in the quarter column. Those checking within 1-2 diopter were 7 per cent. Perhaps I had better say these tests were all done first with manifest tests and then followed by cycloplegic, and these are the results as checked against each other. The axis of the astigmatism checked exactly in both tests in 54 per cent, an error of 2.5 degrees in 12 per cent, an error of 5 degrees in 18 per cent, and more than that ran 16 per cent. When the error in the axis was as much as 10 degrees it was always in astigmatisms of less than 1-2 diopter. An astigmatism of 3-4 diopter always checked within 5 degrees in the axis, and over 1 diopter they checked within 2.5 degrees. Going back to that, I noticed that 92 per cent of the cases checked within 1-4 diopter.

I also kept count of these by ages. In those cases up to 10 years of age I found them 32 per cent correct, from 10 to 20, 36 per cent, and from 20 to 30, 54 per cent; that is, not 54 per cent of all cases, but of those in that age group. Thirty to 40 years, 69 per cent, and from 40 to 50, 81 per cent. I didn't, of course, have any cycloplegic tests beyond 50 because I don't use it very much past 45; so we didn't have very many in that group. That brings attention to the fact that the error is correctible in the older patient almost exactly, and those are the ones with whom you really need to have it checked, because in the younger ones you can test them easier with cycloplegic at any rate and probably that should always be done. It is in these older patients where you are afraid to use the cycloplegic that they check most accurately.

There is one thing to be said in making this contrast, I have astigmatism myself, and I have tried this and it worked very beautifully. In checking for the amount of astigmatism you endeavor to get your axis as nearly in line to the astigmatism of the eye as possible; that is, you put it up, say with the plus cylinder, vertically and then flip it over. If they see better with the plus axis vertically than with the plus axis horizontally, you put a plus cylinder in the vertical axis. In checking for axis of the astigmatism, the handle is placed in line with the axis, or in other words, 45 degrees of the cylinder in the frame. For instance, you have an astigmatism of about 1 diopter, say, of axis 75, if you place the plus cylinder 90 and then flip it, it will be better with the plus 90 if you will slip your cylinder in the frame at axis 90. Then to

try for the axis you hold it with the handle either vertically or horizontally. In that case it will be better to one side, and you shift your axis of the cylinder to that side.

I never ask them which is better with these tests. That is not supposed to be good. You ask them which is worse. They will tell you which one is worse. The other one necessarily is better. You don't want them to get the idea that you are trying to improve them so much. What you want to find out is which one is worse, and the other one is necessarily better.

**C. T. Wolfe, Louisville:** Dr. Cowley sent me a copy of his paper and asked me to discuss it, knowing I was in contact with Dr. Crisp on one or two occasions. I am sorry you all haven't had the opportunity to read that paper because it certainly covers the subject very thoroughly.

Dr. Cowley has reviewed this subject in a very able manner, and I am sure we are indebted to him for his efforts.

Three years ago I attended a lecture on the cross cylinder given by Dr. Crisp at the Academy meeting. His talk was so convincing that I immediately began using the method.

Approximately 80 per cent of my eye work is the measurement of ametropia, so I think it is indeed timely to consider any measure that will aid us in doing better refraction.

Since the essayist has clearly defined the cross cylinder and the combinations most commonly used, I will discuss the indications for its use. This lens is intended to help us determine the cylinder required in astigmatism, and all tests for astigmatism can be more accurately done with suspended accommodation.

The approximate refractive error having been determined by the use of the ophthalmometer, retinoscope, astigmatic charts, trial lenses, etc., and with this approximation in the trial frame before the patient's eye, the spherical correction is ~~accurately~~ determined by the addition of plus and minus spheres. It is true the sphere may later had to be changed, but we start with it as nearly right as possible. The cross cylinder is then used as Dr. Cowley has stated.

One point I should like to emphasize, is that the use of the cross cylinder may not improve the vision. In this we are not concerned particularly, for of greater importance is the patient's selection of the two positions that the cross cylinder is placed before his eye. This point determines the direction that we will move the cylinder in the trial frame.

I have found it also helpful in cases where we feel that a sphere only indicated and no cylinder is of apparent advantage. The cross cylinder held in different positions may convince us that there is a difference in one meridian. By placing a week plus or minus cylinder at the axis indicated, the use of the cross cylinder will definitely prove whether it is to be used, increased in strength or abandoned.

Another point that the essayist made that I

want to particularly emphasize is, that if the spherical correction is changed the axis of the cylinder should always be re-tested.

I feel that one doing careful refraction should avail himself of every method that experience has proved to be helpful and bear in mind that refraction requires patience, accuracy and thoroughness.

Again I want to thank Dr. Cowley for bringing this subject before us and compliment him upon the way he has presented his paper.

**R. H. Cowley, Berea, (In closing):** Since I have been using this method I have found to my own satisfaction that the astigmatism in the eye changes from day to day. I don't know whether the other men have found that or not, but I have had cases that I have examined several days in succession. I have found that the axis of the astigmatism, usually only in one eye, changes as much as 15 degrees over a course of a few days. It means that we must test that sort of case several days and find what his variation is and then give him a cylinder somewhere in between the two extremes and he will be satisfied with it.

I have had patients who have been trotting around from one doctor to another for a long while. They will have an axis of 105 one day and perhaps 90 another day. One doctor will give them 90 and another 105. The correct glass is somewhere between 90 and 105. This may be heresy, but it is true because I have tested it out to my own satisfaction.

Another point is that you must approximate the strength of the cylinder that the patient needs before your cross cylinder can be used to advantage. I was going to demonstrate that but I didn't have time. If you put a 250 cylinder on there it musses the letters up in such a way that with your cross cylinder it is hard for the patient to tell which is best. You must get to the point in the refraction where the patient can see the letters with a fair degree of accuracy before the cross cylinder can be used.

I want to say that Dr. Crisp is going to be at French Lick this year. He is going to have one of his demonstrations at the American Academy. I am going to "pump" him and see how much I can get out of him on the cross cylinder. If any of you men happen to be going to the American Academy and can take that demonstration it will be well worth while. I don't want to be presumptuous about this. I just simply dropped on to something that I think is mighty valuable for me, and I am glad to go to any trouble it might be to demonstrate it to the other men. If you want to stay this evening and work with this in a dark room for two or three hours with Dr. Stern and myself we will stay. I will go to any amount of trouble to try to get it over to you. It must be demonstrated personally in order to really understand it.



HAYFEVER, DIAGNOSIS AND  
TREATMENT\*

E. V. EDWARDS, M. D.

Mayfield.

Allergy may be defined as an allergic reaction, representing an altered reactivity on the part of certain body cells to substances which are innocuous to the majority of individuals. The unusual reactions are due to the fact that the patient has inherited the ability to become sensitive in most instances, although the actual sensitivity is acquired. The type of reaction depends upon the location of the cells involved. If cells of the mucous membrane of the eye, ear, nose and throat are sensitive, symptoms of hayfever are present. If the cells in the skin are sensitive, Dermatitis, Eczema or Urticaria may follow. If cells in the mucous membrane of the bronchial tubes are sensitive, the symptoms spoken of as Asthma, result.

Henry (1) states "in a recent survey of a thousand cases, that children below the ages of sixteen, gave a positive family history in 91.6 per cent of cases. Adults between the ages of 20 and 40 gave a positive family history of 70.5 per cent. From the ages of 40 to 60 the family history dropped to 56.2 per cent." If these reports are true, and we have no cause to dispute them, then the history of a suspected case plays an important role in our diagnosis.

Markaw & Spain (2) report the incidence of allergy as to sex, "about evenly divided, 104 males and 96 females." It is surprising to see the preponderance of males in any Clinic, and this speaks well for the interest of patients in taking time out of work for relief. "In 1928 the figures were 60 per cent male and 40 per cent female." The ages of the patients appearing in the Clinic for relief begin in infancy and gradually increase to between the ages of thirty and forty, when the curve drops rapidly. The cause of this rapid fall, is perhaps due to the fact that most all hayfever cases, if untreated for years, become Asthmatics in middle life, and the lesser condition is overshadowed by the greater one. Balyeat (3) states "fully 65 per cent of hayfever sufferers untreated, develop asthma."

The progress in the diagnosis and the treatment of hayfever patients, during the last ten years has been very encouraging. The last three years, especially. Those familiar with the work of the Allergist, are realizing that here at last, is a very definite source of relief in this class of sufferers.

Allergy has become a very distinct specialty. It has included in its study, asthma, hayfever, intestinal and digestive disorders, urticaria, eczema, angio-neurotic edema, and many other diseases.

Hayfever has perhaps played the most important role, with asthma a close second. Hayfever has been described as "a form of allergy that is generally limited in its symptom complex to the mucous membrane of the upper respiratory tract and the eyes." It is characterized by its sudden appearance of symptoms corresponding to a period of pollination of certain trees or grasses, and more rarely contact with certain animal epithelium or perhaps the ingestion of certain foods.

Hayfever for purposes of description has been divided into, perennial and seasonal. The perennial type occurring throughout the year. The seasonal type appearing in three major seasons. The spring season corresponding to the pollination of the trees. The summer season corresponding to the pollination of the early grasses and weeds, and the fall or the late summer coming principally from the pollination of late weeds and grasses. In Kentucky, the ragweed playing the most important part at this time of the year. It is at this time that we see most of the hayfever sufferers. Though we must not lose sight of the fact that there are many cases occurring at these earlier seasons. A chart of the time of pollination of the various trees and grasses from a local Botanical survey, hung on the wall of our offices, would be a simple way to keep this in mind. It would also be well to have a chart showing the beginning of the pollination, the height of pollination and the fall in the amount of pollen in the air during the ragweed season. The late summer season, or as we commonly refer to it as the ragweed season, furnish us by far the preponderance of cases. The short, giant and southern ragweed all occurring in most sections of Kentucky. The short ragweed however, seems to be the principal offender. They begin their pollination around the 15th of August and reach the heights of pollination about the 15th day of September. Pollinating, however, until a heavy frost kills the plants. Though ragweed is the principal factor in causing hayfever at this time of the year, it is important to know; and to be able to recognize the fact that some grasses, or perhaps a seasonal food, may be causing the attack.

The seasonal hayfever sufferer with the attack coming on the middle of August, and yet on testing, we find this patient is only lightly or not at all sensitive to ragweed, and unless the cause is carefully worked out and the proper treatment instituted, we can not expect to obtain a happy result for this patient.

Read before the Eye, Ear, Nose and Throat Section of the Kentucky State Medical Association at Lexington, September 7, 1931.

## DIAGNOSIS

Here lies the greatest problem, and if we expect to get relief, for the greatest number of patients, careful testing is very essential. The methods used in determining the causative agents are namely: 1. Scratch. 2. Intradermal. 3. Conjunctival. 4. Patch. 5. Passive transfer, and 6. Nasal. All have their advantages, though the scratch and intradermal tests are perhaps used most, and are certainly the most practical. Some allergists employ only the scratch method, while others use only the Intradermal.

After careful study and observation, it appears to me that both are essential in the study of allergic individuals. In the exceptional cases, it may be necessary to resort to some of the other above named methods. One prominent doctor has said "That the Intradermal test was unquestionably the thing that pulled the Fat Out of the Fire, for the Allergist." An intradermal test dose will often give a very positive reaction, when a scratch has failed entirely. However, caution should be observed in using the intra-cutaneous method, and especially when testing with some of the more toxic pollens and proteins.

For Example: Egg-white, has been known to give a severe systemic reaction from a scratch test alone. Like-wise ragweed has given severe constitutional symptoms. For this reason the scratch test should always precede the intradermal method; fatalities have been reported following the use of the intradermal test when this precaution was not observed. These cases point out to us that this testing of patients is not without its dangers. A recent report by Efron & Penfound (4) point out the value of the nasal mucous membrane as a testing field, by the use of the raw pollen. It has been said "that certain organs only are receptive to Allergens, and that unless the skin is so, no reaction can occur."

There are no doubt instances when many of the above mentioned tests would be the method preferred, but in a well organized busy Allergy Clinic, the combined skin and intradermal tests are the methods of choice, and have proven their efficiency and practicality.

Henry (5) states "A great step forward was the introduction of the intradermal method of testing." All of us in times past, have suffered bitter disappointment with the "scratch" test. Many who still use it alone have come to the conclusion that testing is worthless. The "scratch" test works very well for seasonal hayfever, but the majority of Perennial hayfever and Asthma patients give negative test with this method. Frequently in testing an Asthmatic, three hundred "scratch" tests will be negative. Upon

intradermal testing, the same patient will show one to thirty positives. One might well ask, "Why bother with the "scratch" test"? This is a reasonable question and an important one. The "scratch" test is indispensable, crude as it is, because the intradermal test is not safe, unless preceded by a negative or doubtful "scratch" test. This is so because occasionally an individual is so extremely sensitive to some protein, egg-white, for example, that the "scratch" test will give an enormous wheal, and no further information is needed. And further another step forward has been the improvement in the preparation of the various substances used in this work for testing and treatment. Pollen extracted in water or alcohol deteriorate rapidly and soon become worthless. Because of this fact, Stier, as a result of his experiments began the use of glycerine extract and found that after three years, the original preparation was as potent as the day it was prepared. Since his report glycerine extracts are fast being adopted by many allergists.

A patient who is a merchant in the dry goods and ready-to-wear business, and that was a severe hayfever sufferer came to me for relief. On testing this patient routinely, he was found to be 4 plus to all three ragweeds and 6 plus to silks. Nothing else reacted. The first year of treatment gave very little results, because he failed to avoid the thing he was most sensitive to. The second year, however, by being cautious of the silks during the hayfever season, he obtained a hundred per cent relief. The literatures are full of many similar cases. Proving beyond a doubt that careful testing and attention to detail, are essential in the practice of a successful allergist. From this example we can readily see that a large number of substances must be included in testing a patient, in order to rule out secondary factors.

One man whose work I am very familiar with, advocates and practices the employment of all the pollens common to that region. All common animal Epithelias and a miscellaneous group including Orris root, Pyrethrum, etc. Feathers classed of course in the animal Epithelias. The average number of skin tests placed on a Seasonal hayfever case is about two hundred and fifty. In perennial cases and in asthma about five hundred. This varies according to age, diet and history.

## TREATMENT

Let me begin the discussion of treatment of hayfever by refreshing our minds and calling attention to the many so-called cure remedies, advertised in our newspapers. I also wish to plead guilty to many practices just as far fetched. For example, Cauterizing of turbinates, even the removal of turbinates. Ethmoid punctures and the removal



of cells. Sprays, packs, electrical treatment etc. In fact about all the measures I could read about or hear about. Trying honestly, yet desperately to relieve this class of sufferers who find their way to the office of a nose and throat physician, seeking some relief. At the same time, as a nose and throat man, I am going to uphold the stand we have taken. Nor can I blame any man of our specialty for being just a little pessimistic of this new hayfever remedy, when there is not one among us who has not at some time given the pollen treatments a supposed trial. But in the end the results were so meager, we lost interest in this much touted cure and returned again to empirical treatment. This failure, I believe can be explained. First, improperly equipped men working in this field and the lack of knowledge concerning present day methods. Second, ignorance of the Botanical Flora of our immediate locality. Third, testing with improper, inferior and impotent testing material. Fourth, lack of knowledge and the technique of testing, and the experience of interpretation in the reading of tests. Fifth, improper percentage of offending pollens in the treatment set, and an inadequate dose given patients. Sixth, failure to take into account secondary factors. If we will only familiarize ourselves with the literature on allergy, it will be plain to see why only a small group of cases will receive any relief from the usual fifteen dose immunity package that we purchase from a pharmaceutical house.

Before the institution of treatment and after proper skin testing, a full history of the patient and a check of the time of onset of symptoms, as compared with the time of pollination for the positive reactions, should be made. Comparatively few patients react only to a single pollen. Piness (6) states, "that only twenty and two-tenths per cent out of two hundred and two cases, gave a single reaction, all the rest were multiple in their sensitivity. Treatment should begin three months before the expected onset of the symptoms, in order to safely bring the immunity up to the highest point. Doses are given three to five days apart, using four dilutions, 6 doses to the dilution, beginning with .05 cc, increasing each dose .05 until all doses are given in that dilution. Then begin the next dilution in the same manner, and continue until the highest dose is given without a local reaction. This dose is then continued weekly throughout the season. The dilutions used are 1:2500; 1:500; 1:250; 1:50.

If we get a local reaction of any consequence at any time during the treatment, the same dose should be repeated until there is an absence of any local reaction. It has been said with authority "that the patients giving

the most reactions get the best results". This has been my experience in the comparative small number of cases I have treated. A few cases may develop symptoms during the season with this method of treatment, and if they do, it has been suggested that small doses given at daily intervals will control this type of patients. Then we have another group of patients in which the trees and grasses are a factor, and it becomes necessary to treat these cases the year around. This seems to me is the logical thing to do in all perennial cases, even though ragweed may be the dominant factor. I have experienced failure in a few cases, because I failed to treat them as perennial hayfever. The promiscuous injection of treatment material by doctors who have no knowledge of the potency of the extracts or the probability of a systemic reaction, is a dangerous practice. These antigens are powerful in their action, and as I have already pointed out, death can and has resulted from their misuse. Out of thirty-two cases under my personal supervision last year, I had but one failure, which was easily explained by his own misconduct. This case has asked me to treat him again this year, and promises to be good.

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#### DISCUSSION

**R. M. Armstrong:** Dr. Edwards is to be congratulated on the careful and thorough manner in which he has presented the subject of "Hayfever."

Of course, we realize that we have not reached perfection in the diagnosis and treatment of this condition. We must recognize two distinct types—the extrinsic and intrinsic. Food plays a great part in these types, as well as pollen.

We recognize that perennial type may be a manifestation of certain foods, animal proteins, etc. The seasonal type appears to be due to pollens, which we find very difficult to control in certain localities. Most patients prefer a change of location rather than the tedious treatment, which in many instances, gives so little relief.

**S. B. Marks, Lexington:** During the winter I read an article by Dr. Edmonson of Illinois. It was in the March number of the Eye, Ear, Nose and Throat Journal. Dr. Edmonson lives in a mining community and sees a great deal

of asthma. He thinks it belongs to the hay type of asthma. He began to experiment with some nasal applications that would produce more or less permanent shrinkage, and, at the same time, desensitize to a certain extent. He began using different strengths of aluminum sulphate to shrink and silver nitrate to desensitize and added to that zinc sulphate in cases where infection was present with the hope of getting some ionization of the zinc sulphate.

As I was very much interested in his report I wrote to him and he sent me a circular letter that he had written. He said he had had so many inquiries he couldn't answer them personally.

I have been using this summer varying strengths of aluminum sulphate and silver nitrate on probably a dozen cases and each case has been tremendously benefited.

I had one boy who had been in trouble since he left home Christmas to go to school. He came back in June, a boy about 10 years of age. His eyes were suffused and swollen and his nose was absolutely blocked. I gave him three of these treatments, without attempting to discover the cause of it. I used about 2.5 per cent aluminum sulphate and  $\frac{1}{2}$  of 1 per cent silver nitrate. I have seen him once since then and he has had no further trouble.

I have had three or four cases of asthma in children and they have been tremendously improved. The nasal mucous membrane stays shrunken and it stays pretty well desensitized. Of course, there is nothing scientific about this and Dr. Edmondson doesn't claim there is, but it does give relief. I had one girl who came in and in three days she was playing golf and she had no further trouble. Unfortunately I haven't been able to test out any of these cases that got relief and I don't see them any more, but it has really been very valuable in relieving acute cases.

**M. C. Baker**, Louisville: The great trouble in treating hay fever patients is getting them in ahead of time, either to give them the pollen extracts or to build up their general condition or to relieve any nasal condition that might exist prior to the hay fever season. That is where the great trouble comes for all of us who have to treat hay fever patients.

I personally feel that hay fever is due to some electro-chemical change in the body. I believe that this electro-chemical action exists in the body anyway, and it is influenced either by the ductless glands, such as the pituitary and the adrenal, and also by the so-called hormones in the digestive tract. I believe that eventually the treatment of hay fever is going to depend on finding some drug or some chemical or some sort of treatment that will create a balance between these ductless glands in the system and these so-called hormones of the digestive tract, until then I don't think we are going to have any

success in the treatment of hay fever. I believe that a person who doesn't have an allergy of some sort—and they certainly are lucky whether it is hay fever or migraine headache or asthma or whatever it is—have perfect balance between the functioning organs of the system and I believe eventually the solution of the whole matter will be finding the sort of treatment that will create this balance in the system.

**A. L. Bass**, Louisville: I think Dr. Edwards' paper is one that we should show more interest in than we do. There are three important factors in hay fever: diseased nasal mucous membrane or neurosis or hypersensitization to individual pollens. Either two of these three factors play a very important part. Unless they have a diseased condition or neurosis I can in most instances pick out the allergic individuals. You look into a good many of the noses; and that is the most frequent portal of entrance, and you see a boggy water log condition of the mucous membrane.

I think, as Dr. Yates said, a lot of these youngsters suffer from food allergy. I have picked up several youngsters just by eliminating the food. They don't have such a variety and you can work it out by an elimination process. For instance, I have had a youngster who is sensitive to orange juice and another to chocolate. Asthma is a complication in about 50 per cent of the cases. If it is a seasonal condition it may show up a little later than the hay fever, but it will make up for it by keeping up the asthmatic symptoms after the local symptoms have disappeared, and that is true if the bronchial mucous membrane is hypersensitive as well as the nasal mucosa.

Dr. Baker brought out a theory. We don't know all we should about the vasomotor system. Why should one person be hypersensitive to some foreign protein and it not have any effect on another?

Relative to surgery; when you look into a nose during a hypersensitive state, it may appear at first that a lot of surgery will be required or should be done. If it is a seasonal condition, wait until that person gets over his seasonal sensitiveness and see what condition that nose is in after you get away from the causative agent. In many instances, instead of doing a lot of surgery you won't have to do any, or very little.

As to treatment, I think as long as you are using your protein, pollen extracts, and so forth, you should consider the acid treatment as recommended by Beckman and brought out by Gleason; that is, where these people don't have any diseased condition except local manifestations. I treated a doctor who had a course of injections with the pollen extracts which he was sensitive to. I put him on the nitro-muriatic acid treatment, as recommended by Beckman,



with complete relief from his symptoms. He said he would a darn sight rather have that relief than go through the injections of pollen extracts. It is about the same percentage of results. In about 2000 cases reported by Vander Veer, Rackemann, Piness and Smith treated with pollen extracts, they reported partial and complete relief in 70% of cases, while Edmonson reports 66% partial and complete relief with the acid treatment.

I am glad Dr. Edwards brought this question up as I think we should take more interest in it.

**E. V. Edwards**, (in closing): I wish to thank the society for its frank discussion of my paper, and in closing will say that the study of Allergy has been a hobby of mine for the past four years. I became interested through my association and friendship with Dr. Henry, of Memphis, Tenn., observing the almost miraculous things he has done in his clinic are significant and evidence of the value of this work.

Dr. Yates and Dr. Bass made reference to the quick response of children when an offending food is removed from the diet. This is because children have only a relatively small number of atophens to which they are sensitive.

The chemical treatment spoken of gives only temporary relief and is useful, but offers no hope as a cure.

Dr. Armstrong mentioned the fact that it was hard to get these cases in his office. Such has not been my experience, rather the opposite is true, and I believe it is because of the results obtained. Careful testing to determine the causative agents, followed by either the elimination or the desensitization treatment has certainly given results.

**Medullary Defecation Center**—Koppanyi conducted experiments on dogs to determine the effect of various drugs on the defecation center. He found that codeine, picrotoxin and heroin are centrally acting evacuants; the application of centrally acting evacuants to the floor of the fourth ventricle may elicit straining and defecation; lesions in the floor of the fourth ventricle, or application of morphine sulphate to the floor, may abolish the straining and defecation that follow the injection of centrally acting evacuants afferent impulses for defecations may originate in the small intestine; the vagus nerve carries efferent impulses concerned in defecation of medullary origin; dogs that did not vomit from apomorphine and did not defecate following the administration of codeine failed to vomit following the injection of pilocarpine, digitalis and antimony and potassium tartrate but vomited on oral administration of local irritant emetics, antimony and potassium tartrate, zinc sulphate and mercuric chloride; the nature of the vomiting and defecation centers is discussed in the light of the experimental data obtained.

## ACUTE MASTOIDITIS, WHEN TO ADVISE SURGICAL TREATMENT\*

L. P. MOLLOY, M. D.

Paducah.

In presenting a short paper on Mastoiditis we only do so from the fact that we find it to make up quite a percent of the Otologist's work and not that we have anything new to offer. The patients we are daily asked to advise is the ear that is not discharging and should be, and the one that is discharging and should not be.

Granting the fact that Acute Mastoiditis usually complicates Otitis Media, then the point of diagnosis to determine is—when does your Otitis leave off and your Mastoiditis begin. This brings us to where we might refer to the Anatomy of the parts in order to get their close relationship to each other. The middle ear cavity, as you all know, is small and very irregular, being situated in the petrous bone. The mastoid cells lying behind, the meatus Auditorius externally and the Labyrinth internally. This cavity being filled with air and connects with the Nasa-Pharynx by the Eustachian tube. The posterior wall contains the opening leading into the mastoid antrum which further communicates with the mastoid cells which contain air. The mucus membrane of the Tympanic cavity is continuous with the Pharynx through the Eustachian tube and is further reflected into the mastoid antrum and cells which line it throughout. Now, roughly, we have the connection of these cavities showing how easy it is for infection to travel from the nose through the Eustachian Tube into the middle ear, mastoid antrum, mastoid cells and other cavities that our infection may have access to.

This gives us a picture which shows us that these cavities are hard to drain, by what we might term, the normal route. Again, these cavities are so closely allied with each other that it is hard to discuss Mastoiditis without Otitis Media. For, as we have indicated before it is very hard to say just when your infection passes from the middle ear into the mastoid and only can we determine this by careful examination, observation and treatment.

Acute Mastoiditis attacks at all ages regardless of race or sex, the disease occurs more often in children and young adult life than later in life, due no doubt to an easy approach to the mastoid region by the infection, especially in children. Further, the condition of the nasal route associated with the tonsils and adenoids being one of the

\*Read before the Eye, Ear, Nose and Throat Section of the Kentucky State Medical Association at Lexington, September 7, 1931.

leading factors in producing the infections that we so commonly see beginning in the nasal fossae and terminating in mastoid cells. The low altitude, the damp low lands that surround us in our end of the state seems to be one of the leading exciting causes of this condition.

The great masses of children that are first seen by the family physician and many of them later by the specialist, with discharging ears of an indefinite period of time is usually the sequellae of an acute mastoid infection. These cases, especially in children are of more importance because the child's life is yet to come. The majority of them have not finished school work and the deficiency that usually comes about in this condition markedly impairs the child's health which is a great handicap during its school period from a standpoint of general health and naturally retards the child mentally. This particular patient as you all know is constantly absorbing poison from the condition and will sooner or later make its manifestations by attacking some of the vital organs of the body including muscles and joints and lowering the resisting power of the patient which makes it more susceptible to many of the diseases of childhood, or as for that matter, any diseased condition that attacks the human being. Furthermore, it lowers the young man or woman's rating in the business world, for the various reasons we have stated, including loss of hearing. Many of these cases we see appeal to us for relief from the foul odor which comes from these ears. A great per cent of these cases are referable back to early days of childhood, possibly when they were nursing, for their first attack of ear trouble. Then we get the history of a continued discharging ear for several weeks or possibly months, then the discharge possibly ceasing with a number of recurrences during the following years. We are now speaking of the young man or woman entering the business world.

The innumerable conditions that may attack this type of patient later in life as you know, are too many to mention in a discussion of this kind, but to say that we have lowered this patient's vitality and resisting power both in regard to disease and his ability to cope with the business world is putting it mildly by allowing them to get in this condition. For, as you know the great business interests of our nation that furnish us employment for our laborers, do not look upon this class as desirable applicants when they come for examination, and furthermore, we have completely destroyed this patient's chance of obtaining insurance. Again, this condition frequently continues as a permanent draw upon the patient's health all dur-

ing his life notwithstanding the fact that operative procedures which may be major in type, did not give complete relief, and frequently after radical mastoid operations the discharge continues.

We are living in an age when the young professional man or woman must retain all their mental faculties in a normal way if they are to make a success in life, and to be assured of their health. I am making an appeal for an early recognition of mastoiditis by the family physician for he is the man who comes in contact with these various ear conditions and should early realize the importance of a prompt and accurate diagnosis, for time to my mind, is the greatest factor that we have to deal with in this disease; in regard to its early termination and the manner in which it terminates; whether we are to have the chronic condition left with the many handicaps and pitfalls that have just previously been mentioned. We believe that practically all these cases seen by the specialist at the proper time and allowed to be handled in a proper way, will become void of the many things that we have to contend with, following such conditions at the present time. The early removal of all factors, both pathologically and exciting that bring on this disease, need no mentioning before a body of this type of men.

I am pleading for a better understanding between the family physician and the specialist in regard to these conditions. The same thing has been overcome by the general surgeon. The family physician no longer holds his case of appendicitis until it becomes a dangerous procedure to operate or has passed the proper time for an operation. We all have the picture renewed in our minds almost daily of the type of case coming in late from the rural districts that should have had drainage days and possibly weeks before we see the case, frequently with added complications which makes the mortality rate very high. The specialist is not to be held responsible for these types of cases regardless of his method of treatment, but with some better understanding between the physician who refers this business in regard to the importance of getting these cases in early as they do with the general surgeon when they recognize a surgical belly.

To separate acute mastoiditis from the middle ear cavity is impossible. The two conditions are so closely allied to each other, the early symptoms being the same that it is only by the usual method of drainage that we are able to differentiate between the two. The varied symptoms that may present itself in this disease we cannot go into. The usual case as we should see it is that of a patient showing middle ear infection of three or four days,



frequently the ear has been allowed to rupture itself or the drum membrane has been incised; with good drainage we find this patient suffering quite a good deal of pain about the ear radiating over the side of the head of the affected ear with the point of tenderness over the mastoid area with the usual rigors and temperature trend of a pus condition. The pain is more or less continuous and as the condition progresses the patient takes on a more anxious look and shows the expression of a sick patient. Should this clinical picture continue after drainage has been established through the drum membrane, I do not believe we are justifiable in waiting very long until we advise drainage of the mastoid. In other words, my contention is, if we are dealing with a middle ear abscess after the drum is opened, drainage established, our temperature will go down to normal, pain cease, tenderness over mastoid will be markedly improved within twenty-four hours, child cheerful, wanting to be up and at play. The only thing we have left is a discharging ear, which in a great majority of cases will cease within from four to six days with ordinary cleanliness.

While on the other hand, should this patient's temperature, pain and restlessness continue, rigors and sweats making up the usual clinical picture of a sick patient due to infection, we see no reason why this operation should not be advised any time after forty-eight hours from the time it failed to respond from the first drainage. However, these cases are all individual and each must be considered by the physician in attendance, taking into consideration the general condition of the patient and the rapidity with which the inflammation may be traveling, which with a close observation of your chart record and patient will be easily noted. We are all agreed that this is purely a surgical procedure and that when this infection has passed into the mastoid antrum and cells—why carry the condition longer? We will grant that many of these cases without surgical interference drain out and get up and go on and are not well, but with a diseased process of bone behind the ear which nature cannot clean up, leaving our patient with a chronic mastoiditis with the usual discharging ear and with the many things I have enumerated and could be further enumerated if we had the time.

Personally, I think it much better and safer to submit our patient to a simple mastoid operation done under the proper surroundings any time than to be left with a discharging ear with from one to two months' standing, for we invariably know that this patient is coming down later in life with an acute exacerbation which will demand surgical interference in order to save life, and

these are the cases as you all know that gives us our brain complications.

I have said nothing of the irregular type of acute mastoiditis because time will not permit it in a short paper of this kind. As for the special points diagnosed, we are all familiar. The X-ray we consider of some value, but not so much so as in the chronic form. Transillumination, if properly studied by taking a series of normal cases and studying the light reflex in detail making repeated comparisons, I do believe is one of the most accurate diagnostic measures we have outside of pain, discharge and temperature, which may be absent at times.

In conclusion, we again impress the importance of an early diagnosis. As for symptoms, age, thorough history of the case in regard to the number of previous attacks of ear trouble, dating back as has been emphasized to early childhood. The clinical picture as it presents itself in the sick room are the factors as to determine when we shall advise an operation. Again, referring to the case above outlined; if we are satisfied after the time mentioned that we are dealing with acute mastoiditis and that we are all agreed that the treatment is purely a surgical procedure, then there is nothing further to be gained by waiting, but in a great per cent of cases we may endanger the patient's life by not giving early drainage. We do not look upon this condition at this particular time as being detrimental to life, but if carried without surgery the longer the wait, the more chances for complications and less resisting power of the patient to stand the operation and the greater the involvement of the mastoid process when we do operate. I do believe we are justified in advising a thorough simple mastoid operation at this time.

#### DISCUSSION

**J. D. Williams, Ashland:** Perhaps I am a little radical in this matter. I believe that the principle of prevention as against that of cure should obtain here as it does elsewhere. I am firmly of the opinion that if the adenoids of the patient were removed early in the game, the tympanum widely opened with an incision extending into the mastoid antrum, which can frequently be done in children, that in such cases where even the zygoma is involved, the ear pushed downward and outward, the eye swollen on that side, you can in a considerable proportion of these cases get the patient entirely well and quickly by this comparatively simple procedure. Harold Hays has reported hundreds of instances in his experience in which this has taken place.

As regards the question of when suppurative mastoiditis begins, I think it is absolutely coincident with pus formation in the middle ear, except possibly in cases where the swelling of the aditus is such that the pus cannot get into the

mastoid antrum—and that is very rare.

One symptom that I consider of great importance is the matter of sleeplessness. The patient complains of some pain or none at all, but certainly does not sleep well. If the sleeplessness is the consequence of nocturnal pain the latter is explained by the dependency of the head when reclining, contrasting with the situation in the daytime. Almost all of the conditions about the head become much more painful when the patient lies down.

I am in entire agreement with Dr. Wolfe as to the length of time that should intervene between incising the drum and the mastoid operation. I never operate if I can help it sooner than three weeks after the incision of the drum.

In two recent cases wherein afterward there continued a discharge and I felt that the cholesteatomata had not been entirely cleared out removal of the tonsils and adenoids and again opening the ear drum affected a rapid recovery.

**C. T. Wolfe, Louisville:** I have listened with a great deal of interest to Dr. Molloy's paper and have received the impression that he desires to give us his idea as to when an acute mastoid should be operated. True, he has violated some of the stereotyped rules that some of us are inclined to follow, but it may be that we are apt to delay mastoidectomies unnecessarily, awaiting positive indications in all links of the chain of diagnosis.

In many respects I heartily agree with him and in others my past experience justifies me in taking exceptions.

I agree with the essayist that ordinarily mastoiditis is secondary to otitis media and that primary inflammation of the cellular mastoid is rare. I do not agree that it is always easy for infection to travel from the nose via eustachian tubes and middle ear to the mastoid antrum and mastoid cells. I believe that there are certain factors to be considered. The aditus ad antrum is not in all cases a large, widely open canal, according to Jackson Coates; it is frequently small in diameter. Quoting from the book further, "it is conceivable that advancing inflammatory swelling of the tympanic mucous membrane, preceding the formation of pus, may occlude this channel and tend to prevent overflow or extension into the antrum."

The speed with which an infection advances depends upon the resistance offered, including the density of the structures and the virulency of the offending organism. If it is not clear that pus has formed in the mastoid process, tentative measures may be employed with a reasonable hope of controlling the process. If, however, it has been determined that the mastoid is involved, operation is indicated. The point I wish to emphasize is that surgery upon the mastoid should rest upon a clear understanding of the pathology of the condition to be treated.

The essayist states that to separate acute mastoiditis from the middle ear cavity is impossible.

This statement, in the vast majority of instances, is true, but recently we had a typical zygomatic mastoiditis which was extensive and painful. The drum membrane was not perforated and there was no sign of inflammation when we saw it. No discharge from the canal was ever noted.

Little stress has been laid by the essayist upon the free opening of the drum membrane. I am sure this was not neglect upon his part, but for want of time. In this connection I want to condemn the simple stab puncture—make the incision free and adequate. I firmly believe it is safer to incise drum membranes too early than permit spontaneous ruptures. A spontaneous rupture, on account of the location of the perforation often demands mastoidectomy in a short time.

The essayist apparently depends upon clinical symptoms almost exclusively as a guide for operative measures. Little or no time is devoted to the types of the invading micro organisms and he gives the X-ray very little credit. Further, he advises operation any time after twenty-four hours if patient fails to respond to adequate drainage.

As to the value of clinical symptoms, I heartily agree that they are of inestimable value and in a very few instances with all of the cardinal signs present, mention of which is quite unnecessary before this body, I have operated. Instances of this kind are extremely rare, however, it is my custom to determine the type of organism responsible for the symptoms. Should the commoner types of pus-producing organisms predominate, operation may be deferred with safety and our patient recover without surgical intervention. The streptococcus in its various strain always causes apprehension.

The X-ray, in our opinion, has enabled us to differentiate surgical from nonsurgical mastoiditis. We employ it and give it much consideration because we have roentgenologists who are competent and thoroughly able to read the findings.

Through my experience, covering both clinical and private practice, I have never operated upon a mastoid within forty-eight hours after drainage was instituted. In this, possibly I have been in error and am glad of the opportunity to have heard Dr. Molloy state his experience.

Judgment and intuition only come from wide experience in mastoid surgery. Frequently my colleagues have helped me to decide for or against operative procedure. Consultation often is of value to the patient and a protection to the surgeon.

**L. P. Molloy** (in closing): I want to thank the gentlemen very kindly for their discussion. I believe the first gentleman rather misunderstood my paper a little when he said I wasn't much inclined to drum membrane incision. If you remember, in referring to case outlined in paper, that after the drum had been properly incised



and drainage established, then if my patient's condition does not improve, my contention is that we are not dealing with a middle ear abscess. With good drainage for twenty-four hours, our patient should be much improved. Otherwise, we find at the end of twenty-four hours after drum incision, that patient's temperature is still up, they have had rather a restless night and pain continues, this again continues twenty-four hours longer, then the case that we must decide, is whether we are dealing with a middle ear abscess or an acute mastoiditis, and my contention is that we have a case of acute mastoiditis. Then, if we are all agreed that this is a surgical procedure, why wait longer?

I look upon the case at this particular time as the general surgeon looks upon a case of acute appendicitis, and I believe we soon will be as free in advising a simple mastoidectomy as he is an appendectomy.

I do not operate on all my patients at this particular time. That should be left to the surgeon in charge. Many of them drain out, and they will get up, but we all know the condition which is left in the mastoid bone and outlined in the paper, and we have this class of patients coming back from time to time with a discharging ear, chronic mastoid infection and frequently low grade meningitis and brain abscess which are operated later.

If we have made our diagnosis mastoiditis, I see no reason why we should wait three weeks to operate.

**G. C. Hall, Louisville:** I would like to ask you a question. Have you had these children's, who are not doing so well, urine examined to see whether they had acidosis or not?

**L. P. Molloy:** I get analyses on most of them. Yes, sir.

**G. C. Hall:** I think you will find that a lot of these children have acidosis in the urine.

#### Reflexes of Sinus Caroticus During Epilepsy.

—Marinesco and Kreindler point out that it is generally accepted that an epileptic seizure is related to disturbances in the cerebral circulation. Because sinus caroticus governs the blood supply of the brain, the authors studied the reflexes of the sinus caroticus on twenty-six epileptic patients, by graphically recording the pulse, respiration and the blood pressure, while pressure was exerted on the sinus. To determine the vasodepressor action of the sinus pressure test, plethysmography was employed. On the basis of their observations the authors reach the following conclusions: 1. The reflexes of the sinus caroticus are reduced in epileptic persons. 2. The vasomotor nerves and the blood pressure show a high degree of instability during epilepsy. 3. In some patients, especially in epileptic persons, pressure on the sinus may lead to typical convulsive attacks.

## MANAGEMENT OF HETEROPHORIA\*

C. D. TOWNES, M. D.

Louisville.

Heterophoria is defined as the latent tendency toward deviation from a normal muscle balance. So long as both eyes see the object upon which the gaze is fixed the visual axes remain parallel but deviation occurs when either eye is excluded from the visual act; when the retinal image in either eye is displaced, or when the retinal image is in some manner distorted. So strong is the desire for single, binocular vision (or so great the dread of double vision) that the tendency to deviate from normal balance when the incentive to binocular vision is removed, will continually be overcome by involuntary effort at the expense of exhausting nervous innervation. It is this effort and nervous innervation which produce the symptoms which follow and often prove so baffling.

In the diagnosis of motor anomalies it does not suffice merely to measure the amount of esophoria, exophoria or hyperphoria present. Of much more importance is the determination of the changes in these relations which take place at the near point and how they change in different directions of the gaze; also, the ability of the eyes to perform parallel movements in the six principal directions and to converge and diverge. Alexander Duane for many years stressed the importance of studying and handling of motor anomalies in this manner. No sounder teachings than his are to be found. It is essential to make a close study of the patient's state of health, temperament, occupation and hours of occupation, habits and heredity. The influence of these factors upon the intricate mechanism of ocular movements involving the fine co-ordination of, at least twelve delicate extra-ocular muscles plus the influence of the muscles of accommodation is not difficult to comprehend. The eyes are continually making many kinds of convergent, divergent and conjugate movements. Some interference with these complicated movements produces the muscle imbalance which causes the patient's symptoms.

A measurement of the deviation in the primary position does not give sufficient knowledge upon which a diagnosis can be made or treatment based. Such measurements must be supplemented by a determination of the ability of the eyes to effect fusion in different directions, especially the six principal directions of the gaze and of the ability to converge and diverge. At the same time it must be borne in mind that motor anomalies, be-

\*Read before the Eye, Ear, Nose and Throat Section of the Kentucky State Medical Association at Lexington, September 7, 1931.

ing due to the balancing of opposing, varying forces which are co-ordinated and regulated by the demands of fixation are essentially variable in character. They will vary from time to time, according to the demands made upon the eyes, as will the methods used to elicit the imbalance, a thorough and painstaking study is indispensable in order to arrive at a satisfactory diagnosis and to determine remedial measures.

The methods of determining the state of muscle balance have as their fundamental

#### ROUTINE MUSCLE TESTS

1. Muscle Balance at 20 Feet (6 Meters)
  - (a) Maddox Rod
  - (b) Screen and Parallax
  - (c) Single Displacing Prism
2. Prism Duction Tests
3. Muscle Balance at Near Point (13 CM)
4. Near Point of Convergence (N P)

principle the changing of one retinal image as to color, shape or position so that fusion is held in abeyance and the tendency to deviation can be easily determined.

There are three kinds of tests: (1) cover tests; (2) distortion tests, and (3) displacement tests.

Cover tests offer a rapid and safe method of detecting the presence of heterophoria. By rapidly shifting the cover from one eye to the other the physician quickly can note whether the eyes remain fixed or move. In exophoria the eye under cover moves in the same direction as the cover as it is shifted to the other eye; in esophoria the movement is in the opposite direction, while in hyperphoria the hyperphoric eye moves down as the cover is shifted to the other eye. This test also can be used satisfactorily at the near point. As the eyes alternate in fixing the test object the patient will be conscious of a sudden movement of the object. Duane has called this the "parallax test." The amount of prism applied to stop all subjective and objective movement is the measure of the deviation.

Displacement tests consist in using prisms to break fusion, and create an insuperable diplopia. The prism of suitable strength is placed base up or down before either eye to determine lateral deviations, and base in before either eye to determine vertical imbalance. The amount of prism necessary to bring the images in perfect alignment is the measure of the deviation. Accurate and dependable, both at 20 feet and 13 inches, this method is probably the most satisfactory of all for determination of imbalance at the near point.

Other displacement tests are offered by the use of the Maddox double prism or Thorington's truncated prism, but neither is as val-

uable as the single displacing prism of Savage.

Chief of the distortion tests is that afforded by the Maddox rod, without doubt the most valuable single test of all, both for distance and for the near point, although in the writer's experience there has seemed to be a probability of exaggeration of the deviation at the near point.

Other distortion tests are those using a cobalt-blue glass or a strong convex sphere with a pinhole disc. They however, are more difficult from the patient's viewpoint and consequently not so practical and satisfactory.

The ability of the eyes to converge and diverge is determined by means of prism duction tests and by a measurement of the near point of convergence. Prism convergence or adduction is the ability of the eyes to overcome prisms placed base out before either or both eyes. The strongest prism overcome without diplopia is the measure of adduction. An average for normal cases is from 12-18 diopters. Prism divergence, or abduction, is the ability to overcome prisms placed base in before one or both eyes. An average for normal cases is from 3-7 diopters.

The ability to overcome prisms placed base up or down is much smaller than when they are placed laterally—seldom as much as 4 diopters. This fact is of great importance in the treatment of hyperphoria.

The near point of convergence is determined by slowly bringing toward the eye any small object which the patient can fix and measuring the point at which the object blurs or appears double. This distance should normally be about 6 cm.

It is important that routine muscle tests be carried out on every patient, and this can be done easily and without undue loss of time. Screen and parallax tests with a determination of the convergence near point will suffice for the routine. Many cases will need no further study. If an imbalance is brought out by these simple tests they can be supplemented by careful measurements by other methods, investigating the different directions of the gaze, and the prism duction power measured to complete the data neces-

#### ESOPHORIA

Convergence Excess	Divergence Insufficiency
O or E Slight	E Marked
E' Marked	O' or X' Slight
Pr. Div. Normal	Pr. Div. Subnormal
Pr. Conv. Excessive	Pr. Conv. Normal
N. P. Very Close	N. P. Normal

O, E, X, equals Orthophoria, Esophoria, Exophoria (respectively) at 20 feet.

O', E', X', equals Orthophoria, Esophoria, Exophoria (respectively) at 13 inches.



sary for a diagnosis.

By such methods we are enabled to determine whether the anomaly is one of excess or insufficiency of divergence or of excess or insufficiency of convergence. It is essential to have this knowledge before intelligent treatment can be instituted.

In the treatment of heterophoria the fundamental principle is that of training the offending muscle or muscles to obey the law governing it—as Savage has said the “supreme law of corresponding retinal points.”

It is by development or improvement of the fusion faculty that this can be done. The normal action of the fusion faculty is two-fold; first, to bring the images on the two retinae into the most corresponding positions by such motor alignment as may be necessary; second, to interpret the two sensations in the light of experience into a single image of greater significance than either taken alone.

Whatever the method we use in the treatment of heterophoria its ultimate purpose is improvement of the fusion faculty, only by which can we hope to succeed.

The treatment of heterophoria consists in careful attention to general health, elimination of foci of infection, correction of refractive errors, muscle exercises, prescribing of prisms for wear, and surgery. Until pathology in other parts of the body can be ruled out we are not justified in classifying any case of heterophoria as congenital. Improvement of the state of general health is the first and most important step in treatment. Correction of refractive errors will bring about relief in many instances, particularly sizeable errors of hyperopia and myopia, in which the relation between accommodation and convergence is a factor in causing the muscle imbalance.

The importance of muscle exercises in treating heterophoria cannot be overemphasized nor the benefits derived from them questioned. Their value lies, not in increasing the strength or function of any individual muscle, but in improving the ability of the eyes through the fusion faculty to secure single binocular vision at the point of fixation.

It is in the treatment of lateral imbalance that exercises prove most satisfactory. Vertical deviations do not respond to attempts at muscle training. Unless parietic in origin hyperphoria exists from early life, though

#### TREATMENT OF ESOPHORIA

	Conv. Excess	Div. Insufficiency
Refraction	Helpful	No Effect
Gen. Health	Helpful	Helpful
Pr. for Wear	Rarely Needed	Helpful
Pr. Training	Rarely Helpful	Rarely Helpful
Stereoscope	Helpful	Helpful
Operation	Weaken I. R.	Strengthen E. R.

#### EXOPHORIA

Convergence Insufficiency	Divergence Excess
O or X Slight	X Marked
X' Marked	X' Slight
Pr. Div. Normal	Pr. Div. Excessive
Pr. Conv. Subnormal	Pr. Conv. Normal
N. P. Remote	N. P. Normal

O, E, X, equals Orthophoria, Esophoria, Exophoria (respectively) at 20 feet.

O', E', X', equals Orthophoria, Esophoria, Exophoria (respectively) at 13 inches.

symptoms may not show up until later years. At no time is there any great variation in the duccion power of the vertical muscles. Muscle exercises are carried out both in the office and by the patient in his home. They consist in prism training and stereoscopic exercises. Careful and painstaking instruction of the patient and supervision in his use of prisms for training will produce results that are most satisfactory. Many patients will be relieved completely of their symptoms, although normal muscle balance may not be restored. What does happen is that their imbalance is reduced to the point that it can be overcome without undue effort.

Stereoscopic exercises, especially when used as advocated by Wells, are almost indispensable in the successful management of heterophoria. Wells' method of decentering lenses in the phoro-optometer stereoscope to obtain prism is a refinement of the prism training method. Every ophthalmologist who is interested in heterophoria should familiar-

#### TREATMENT OF EXOPHORIA

	Conv. Insufficiency	Div. Excess
Refraction	Helpful	Little Effect
Gen. Health	Important	Rarely Helpful
Pr. for Wear	Rarely	Rarely
Pr. Exercise	Helpful	Less Helpful
Stereoscope	Helpful	Helpful
Operation	Strengthen I. R.	Weaken E. R.

ize himself with Wells' book, “The Stereoscope in Ophthalmology.”

Incorporating prisms in glasses for constant wear is seldom necessary except in hyperphoria. As we have already noted, vertical deviations are not amenable to treatment by training and low degrees must be corrected by prescribing prisms base down before the hyperphoric eye. High degrees require surgical treatment. Occasionally, when treatment fails to relieve symptoms and for any reason operation cannot be done it may become necessary to prescribe prisms base in for certain patients with exophoria.

When all other methods have failed and symptoms persist operation is resorted to, the procedure selected depending upon the case at hand and the surgeon's individual prefer-

ence. Muscle exercises, especially with the stereoscope, are again necessary after operation if we hope to obtain most satisfactory results.

In summarizing the following points should be emphasized.

(1) In order to work successfully with cases of heterophoria a painstaking, detailed investigation of all the factors entering into muscle imbalance must be investigated.

(2) Routine muscle tests should be made on all cases before a cycloplegic is used, and repeated with the patient's wearing his proposed correction.

(3) Strict attention to details and faithful persistence in ortho-optic treatment will produce pleasing results and obviate the necessity for surgery in the majority of cases.

#### HYPERPHORIA

- (1) Usually parietic in origin.
- (2) Determine what muscle involved.
- (3) Determine if present in lower field.
- (4) Orthoptic measures ineffective.
- (5) Corrected by prisms.
- (6) Operation only in high degrees.

**Maillard's Coefficient in Hyperemesis Gravidarum.**—Veron and Pigeaud studied the variations of Maillard's coefficient in fifteen cases of hyperemesis gravidarum. The typical syndrome by which they have been characterized was rapid emaciation, absolute intolerance to solid or liquid food, permanent acceleration of pulse, oliguria and acetonuria. Maillard's coefficient was observed systematically in these patients for two or three days, and an interesting curve was drawn in each case which represented the variations in the height of the coefficient. A comparative study of these curves and most careful observations allowed the authors to make the following statement: In all patients who really demonstrated the syndrome of hyperemesis gravidarum at the time they entered the service, the coefficient of Maillard was always over 11. In spite of the apparent gravity of the clinical signs present, in all cases in which the coefficient of Maillard was below 15 the recovery under simple therapeutic measures was prompt and complete. In cases in which the coefficient of Maillard was over 25, the disease was of a particularly severe form and the question of therapeutic abortion was considered. As to the observations in which the coefficient of Maillard was found between 15 and 25, the disease ran a rather mild course and ended finally under correct medical treatment in recovery. The decline in the curve of Maillard's coefficient allows one to observe step by step the progress of such recovery. The variations in the coefficient of Maillard follow exactly the changes that take place in other symptoms and in the course of the disease itself. It seems therefore that this coefficient possesses considerable prognostic value, which is aided by other principal symptoms of the illness.

## A CHALLENGE TO THE MEDICAL PROFESSION

L. E. SMITH

Kentucky State Tuberculosis Association

As a nation, we are rapidly changing from old ways to new. No longer are we content to travel as our fathers traveled, nor are we satisfied to live as they lived.

Among other things, we, as a nation, are fast becoming "public health minded," with the result that many of the diseases that used to exact heavy tolls in human life, have been or are being brought under effective control. We are wont to congratulate ourselves, and properly so upon our rapidly declining death rate, but much yet remains to be done in reducing to an irreducible minimum the ravages of communicable diseases.

Especially is this true of tuberculosis. Despite the encouraging and gratifying fact that the mortality from this disease has been cut more than 50 per cent in the last quarter of a century, tuberculosis still remains the leading cause of death in the active period of life. Last year in Kentucky the Great White Plague caused the death of 2,472 people, 1,558 of whom were between the ages of 10 to 50 years. There must be and is something wrong.

Fifty years ago, Dr. Robert Koch, far in advance of the age in which he lived, discovered the causative germ of tuberculosis. From that day on we have known how to prevent the spread of this menacing disease, but, nevertheless, it has continued to spread.

Another great achievement in diagnosis and treatment of the Great White Plague was the discovery of the X-ray. Still another advancement, perhaps the greatest so far made, came with the development and practical application of the Tuberculin Test. This test placed within reach of the medical profession a cheap, practical and sure method of detecting the presence of any activity on the part of tubercle germs and so made it possible to find infected children before damage beyond repair had been done.

Progress in fighting the disease has certainly not kept pace with advancement in scientific knowledge or improvements in medical care and living conditions. In fact, there seems to be an actual increase in the death rate in early adult life.

In these times of acute economic depression, unemployment, lack of proper food, clothing and housing are all too likely to contribute to further spread of tuberculosis, with consequent increase in death rate and lessening of productive capacity. The question is one deserving the most careful consideration of the medical profession and educators as



well. Tuberculosis still constitutes a public health problem of the first magnitude. We know what to do, how to do it and when it should be done; and yet this preventable disease continues, year by year, to exact a tremendous toll in human life and health.

Is it not about time that we were fully awakening to realization of our duty and opportunity in eradicating one of the most dreaded and insidious diseases known to mankind?

### BOOK REVIEW

**THE COLLECTED PAPERS OF THE MAYO CLINIC AND THE MAYO FOUNDATION FOR 1929.** Volumn XXI. Edited by Mrs. M. H. Mellish, Richard M. Hewitt, M. D., and Mildred A. Felker, B. S. Philadelphia and London: W. B. Saunders Company, 1930. Cloth, \$13.00 net.

In the growth of the Mayo Clinic and the Mayo Foundation many lines of endeavor have found a place and consequently the results of many studies are being published. In compiling a single volumn of the collected papers each year, it has been the policy to select that material which should prove of most service and practical value to the general practitioner, diagnostician and general surgeon.

In 1929 there were 471 papers from which to make selections. Of these 90 are reproduced in full, 23 are abridged, 68 are abstracted, and to 290 references only are given.

**A TEXT BOOK ON ORTHOPEDIC SURGERY.** By Willis C. Campbell, M. D., F. A. C. S., Professor of Orthopedic Surgery, University of Tennessee, College of Medicine, Memphis. Octavo volume of 705 pages, with 507 illustrations. Philadelphia and London: W. B. Saunders Company, 1930. Cloth, \$8.50.

Dr. Campbell's "Text Book on Orthopedic Surgery" apparently was written for the purpose of presenting to the medical profession, including the student, a work on orthopedic surgery that is practical and understandable. It is written in a simple and comprehensive manner, which makes it invaluable to the medical student who must have ready access to diagnoses, treatments and technic. Throughout this text emphasis is placed upon differential diagnosis. All extraneous material is omitted; only that which has been found to be of cardinal practical value being presented. An excellent book for student, practitioner and surgeon.

**TEXT BOOK OF HUMAN EMBRYOLOGY.** By Cleveland Sylvester Simpkins, Ph. D., Associate Professor of Anatomy, University of Tennessee Medical School, Memphis, Tenn. With 263 illustrations and 469

pages. F. A. Davis Company, Publishers Philadelphia. Price \$4.50.

The book has been prepared for the use of students interested primarily in the development of the human body. Where knowledge permits, free use of the functional aspects of development are emphasized instead of the morphological. With the rapid accumulation of information regarding the physiology of reproduction in the human there has been created a need for a modern student's text which would incorporate the essential facts recently available. Dr. Simpkins has very carefully done this.

**PHYSICAL DIAGNOSIS.** By Richard C. Cabot, M. D., Professor of Clinical Medicine in Harvard University. Tenth Edition. Published by William Wood and Company, Fifth Ave., New York. Price \$5.00.

Once again Dr. Cabot, in the midst of his extremely busy career has found time to go carefully over every word and line and sentence of his famous standard work on physical diagnosis viewing each in the light of the new knowledge and experience gained in the last three years, and making such changes and additions as were necessary. The book is and always has been so fundamentally sound that even the author's vast wealth of clinical and diagnostic experience can find little to add to its perfection this year. As Dr. Cabot says in his Preface, "The more important new matter introduced relates to coronary disease, electrocardiography, cancer of the lung, 'cardiac asthma,' toxic hepatitis, and encephalitis lethargica. The sections on laboratory methods of diagnosis have been revised and brought up-to-date." General practitioners, diagnostic specialists, medical examiners in schools, industries, and life insurance work, students, nurses, intelligent laymen, will all find helpful this revelation of the personal knowledge and experience of one of the outstanding medical leaders of America.

**DISEASES OF THE SKIN.** A Text Book for Practitioners and Students. By George Clinton Andrews, A. B., M. D., Associate Professor of Dermatology, College of Physicians and Surgeons, Columbia University; Consulting Dermatologist and Syphilologist to Tarrytown Hospital; to St. John's Hospital, Yonkers; to Grassland's Hospital; and to the Broad Street Hospital, New York City. 1,691 pages, with 988 illustrations. Philadelphia and London: W. B. Saunders Company, 1930. Cloth, \$12.00 net.

Andrews' Diseases of the Skin, marking a definite advance in its field, presents to prac-

tioners and students alike a clear, complete and practical work on dermatology. This text is characterized throughout by its sharp clinical word-pictures. The many and varied causes of skin diseases are clearly outlined and differentiated.

With its clearly interpreted diagnoses, principles of proper treatment, and with its section on radiotherapy and dermatologic atlas, all excellently illustrated by 988 plates, this book brings to modern medical literature a most excellent contribution in the field of dermatology.

**NEW AND NONOFFICIAL REMEDIES, 1931**, containing descriptions of the articles standing accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1, 1931. Cloth. Price, postpaid, \$1.50. Pp. 481 + LVI. Chicago: American Medical Association, 1931.

This volume is the annual publication of the Council on Pharmacy and Chemistry of the American Medical Association giving the latest authentic information concerning those of the newer medicinal preparations found worthy of the consideration and use of the medical profession. Each year the Council scans the general articles under which the various preparations are classified and revises these to conform to the latest and best medical thought.

A glance at the preface shows that a number of preparations have been omitted because they conflict with the rules that govern acceptance because their distributors did not present evidence to demonstrate their continued acceptability, or simply because the manufacturers have taken them off the market. Important revisions have been made in a number of the general articles and in the descriptions of various preparations. Among the new preparations that have been found by the Council during the past year to be eligible for admission to the book are: Amytal and Pulbules Sodium Amytal, 3 grains, barbituric acid derivatives for use preliminary to surgical anesthesia; Thio-Bismol, quine bismuth iodide, sodium potassium bismuthyl tartrate, and Tartro-Quiniobine, bismuth compounds for use in the treatment of syphilis; surgical anesthesia; Thio-Bismol, quinine bis-Seillaren and Seillaren-B, preparations containing the squill glucosides; two new cod liver oil concentrates; Synephrine, a new vasoconstrictor, and synthetic thyroxine.

New and Nonofficial Remedies should be in the hands of all who prescribe drugs. The book contains information about the newer materia medica which cannot be found in any other publication.

**BULLETIN OF THE NATIONAL RESEARCH COUNCIL NUMBER 33.** A compendium of the Statute Laws of Coroners and Medical Examiners in the United States. Issued under the auspices of the Committee on Medico Legal Problems. By George H. Weinmann, LL.D., attorney and counselor at law. Published by the national Research Council of National Academy of Sciences, Washington, D. C. Price \$3.00.

**SIMPLIFIED DIABETIC MANAGEMENT.** By Joseph T. Beardwood, Jr., A. B., M. D., F. A. C. P., Chief of Diabetic Clinic and Associate Visiting Physician, Presbyterian Hospital, Philadelphia, Physician in Chief to the Department of Metabolic Diseases Abington Memorial Hospital, Associate in Cardiology, Graduate School of Medicine, University of Pennsylvania. Herbert T. Kelley, M. D., A. A. C. P., Associate in Diabetic Clinic, Presbyterian Hospital, Philadelphia, Associate in Cardiology, Graduate School of Medicine of Pennsylvania, Philadelphia General Hospital. Diets by Elsie M. Watt, A. B. Illustrated. J. B. Lippincott, Publishers, Philadelphia. Price \$1.50.

The methods outlined in this book have been found helpful in clinic and private practice, and it is believed that this is the first time a complete scheme of this type has been presented to the medical profession and to the diabetic public.

The disease is now controllable by anyone knowing the principles of diet, and a great many cases must of necessity be handled without the aid of hospitalization.

"The Line ration scheme" of Lawrence for diabetics and the similar one of Christian and O'Hara in nephritis have been pioneer endeavors in the field of "Unit measurement," and the adaptation of these methods as outlined in our charts has been found the most satisfactory means of instructing clinic and private patients. The use of the "Diet prescription chart" makes the calculation of the diabetic's diet a simple matter.

Of equal importance with the calculation of the diet is its presentation to the patient in an understandable form and this problem so perplexing for the average diabetic is here simplified.

The first chapter contains only the essentials that every diabetic should know to intelligently co-operate in the management of his case. The second chapter contains information which will be of interest and benefit to the well-trained diabetic and which the physician may find helpful. In the third chapter are grouped the various food values, recipes and suggested menus.



**CONQUERING ARTHRITIS.** By H. M. Margolis, M. D. For the arthritic patient who has become discouraged because of the duration of his disease, regardless of the excellent care which his physician has given him, this book comes as a "message of hope."

The author, himself a specialist in arthritis, feels that information relative to this disease should be given to the patient, not only for his own satisfaction but as a means of urging him to continue under the care of a reputable physician, as improved methods of treatment are making the cure of the disease more and more likely, and many who look forward with dread to being crippled by this disease may have the assurance either of real improvement or an actual cure. The MacMillan Company, New York, Publishers.

**THE SURGICAL CLINICS OF NORTH AMERICA.** (Issued serially, one number every other month.) Volume 11, No. 6. (Philadelphia Number—December, 1931) 309 pages with 87 illustrations. Per Clinic Year (February, 1931 to December, 1931.) Paper, \$12.00; Cloth, \$16.00 net. Philadelphia and London: W. B. Saunders Company, 1931.

**THE SURGICAL CLINICS OF NORTH AMERICA.** (Issued serially, one number every other month.) Volume 11, No. 5. (Pacific Coast Surgical Association Number—October 1931) 279 pages with 109 illustrations. Per Clinic year (February, 1931 to December, 1931.) Paper, \$12.00; Cloth, \$16.00 net. Philadelphia and London: W. B. Saunders Company, 1931.

The various volumes of the Surgical Clinics are always a welcome publication because they are from the leading surgeons and clinics of this country. These volumes are very amply illustrated and contain a discussion almost every subject in surgery.

**ANNUAL REPRINT OF THE REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR 1930.** Cloth. Price, \$1.00. Pp. 91. Chicago: American Medical Association, 1931.

This book is essentially a record of the negative actions of that distinguished body, the Council on Pharmacy and Chemistry of the American Medical Association; that is it sets forth the findings concerning medicinal preparations which the Council has voted to be unacceptable for recognition and use by the medical profession. Many of the reports record outright rejection or the rescinding of previous acceptance; others report in a preliminary way on products which appear to have promise but not yet sufficiently tested or controlled to be ready for general use by

the profession.

Among the reports recording outright rejection are those on: Avesan (H), formerly Nuforal, a mixture stated to be composed of formic acid, sodium nucleinate, camphor, allyl sulphide and chlorophyll, with traces of salicin and sulphuric ether, marketed with unwarranted claims of usefulness in the treatment of tuberculosis, asthma, and other respiratory diseases; Ceanothyn, once before rejected and still found to be marketed with unsupported therapeutic claims; Collosol Calcium and Collosol Kaolin, so-called colloidal preparations, the former an unscientific mixture of unproved value, the latter a possibly dangerous preparation, and both marketed with unwarranted claims; Ephedrol with Ethylmorphine Hydrochloride, an unscientific ephedrine preparation marketed under an unacceptable proprietary name with unwarranted therapeutic claims; Farastan, an unscientific iodine-cinchophen preparation proposed for routine use in "arthritis . . . and Rheumatoid conditions"; Haley's M-O Magnesia-Oil, a magnesia magna and liquid petrolatum mixture in fixed proportions marketed with emphasis on the "M-O"; Lydin, a testicular extract, marketed with claims of value in the treatment of impotence; and Metatone, a shot-gun "tonic" mixture marketed under a proprietary name with unwarranted therapeutic claims.

## ADDITIONAL COUNTY SOCIETY

**Jefferson:** The January program of the Jefferson County Medical Society will be as follows:

### January 4th—Case Report

Post-Operative Paralytic Ileus with Recovery, Wm. H. Emrich, M. D.

### Symposium on Neoplasms of the Urinary Bladder

Diagnosis of Bladder Neoplasms, James R. Stites, M. D.

Treatment of Bladder Neoplasms, John T. Bate, M. D.

Neurologic Aspects of Bladder Neoplasms, J. A. Bowen, M. D.

Discussion to be opened by Owsley Grant, M. D.

### January 18th—Case Reports

Report of Three Cases of Gastro-Intestinal Hemorrhage, J. A. O. Brennan, M. D.

### Essay

Surgery of the Common Bile Duct, Frank P. Strickler, M. D.

Discussion to be opened by John R. Wathen, M. D.

J. D. ALLEN, President,

J. C. BELL, Secretary.

# Kentucky Medical Journal

Published Monthly By

THE KENTUCKY MEDICAL ASSOCIATION  
Incorporated

Entered as second class matter October 22, 1906, at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price .....\$5.00  
Edited Under Supervision of the Council

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NEXT MEETING LOUISVILLE

## COUNTY SOCIETY REPORTS

**Grant:** The Grant County Medical Society met at the office of the Health Department on Wednesday, November 18, 1931, with the following members present: Drs. Blaine, C. M. Eckler, O'Hara, N. H. Ellis, Zinn, Stephenson and C. A. Eckler.

In the absence of the President, J. W. Abernathy, Dr. A. D. Blaine took the chair and presided over the meeting.

The minutes of the last meeting were read and approved.

Clinical cases were next in order and various reports and incidences were reported, with the profession's experience with the scarlet fever prophylactic serum. Everyone realized there was quite a bit to learn from its use as yet.

The topic for the evening was "Pneumonia in Children." A round table discussion followed and was very enthusiastic and enjoyed by all.

Dr. O'Hara opened the discussion and differentiated the two types very clearly, namely, the catarrhal or broncho-pneumonia and the lobar pneumonia. He made an excellent talk, reporting a new treatment in British domain, known as the Thyroid and Manganese treatment, which was new to the society and very interesting.

Dr. C. M. Eckler also gave an interesting talk on the uses of Fresh Air, Diet and Serums in Pneumonia. He thinks not too much medicine is advisable and really no routine treatment. He likes Guaiacol as one of the best remedies in reducing temperature in pneumonia.

Dr. N. H. Ellis and Dr. C. A. Eckler also made brief talks on the subject at hand. Dr. Ellis praises the serum treatment and knows from self experimentation.

The committee appointed to meet the fiscal court and to report at this meeting was continued and ordered to meet with the fiscal court the fourth Monday in November and to report at the following meeting.

There was a motion made and seconded that the Secretary write a letter to Dr. H. F. Mann, expressing the profound sympathy which this society feels for him during his illness, and each one join in wishing him a speedy recovery.

The subject for the next meeting is Blood Pressure, round table discussion.

There being nothing further of interest we adjourned to meet the third Wednesday in December.

C. A. ECKLER, Secretary.

**Jefferson:** The Jefferson County Medical Society have a fraternal dinner December 21 at the Kentucky Hotel and have secured for the speaker A. Graeme Mitchell, Professor of Pediatrics, University of Cincinnati. The title of his address is "A Discussion of Some Phase of Tuberculosis in Childhood." There will also be election of officers and committees.

J. C. BELL, Secretary.



# KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. 30 No. 2

BOWLING GREEN, KY.,

FEBRUARY, 1932

## EDITORIALS

### KENTUCKY AT THE SOUTHERN MEDICAL ASSOCIATION

The meeting of the Southern Medical in November was in every way a success, particularly if we take into consideration "the times"; on the other hand "the place" assuring a successful meeting most any year.

Kentucky was well represented, the attendance of doctors and their wives being about 150, and this in spite of the distance to be traveled.

From the standpoint of activities Kentucky was certainly well represented on the program, the State Board of Health having an exhibit, one of the Louisville physicians being represented in the Scientific exhibit, another participating in the general Clinical Session, and still another responding to the address of welcome.

In the Section work there were three Kentucky physicians serving as Chairman—and in each instance presenting the Chairman's address to his Section—three served as Vice-Chairman, and one as Secretary on the program for the work of the various Sections. There were nine Kentucky physicians who presented papers and eight who were on to open the discussion of various papers.

In the Woman's Auxiliary Kentucky was represented by Mrs. George A. Hendon, first Vice-President, who also responded to the address of welcome to the Auxiliary. At the opening meeting Mrs. A. T. McCormack, a Past President, was on the program for a short talk.

New Orleans always offers many attractions to the visitor, and at this meeting the physicians and their wives were most delightfully entertained. In fact if an invitation to meet in New Orleans should come within the next few years most of the Kentucky doctors and their wives would be heartily in favor of going to New Orleans again.

Altogether Kentucky may well be proud of her physicians and their participation in the Southern Medical Association this year.

## MID-SOUTH POST GRADUATE ASSEMBLY

Among the outstanding medical conventions of the first quarter of the year 1932 is that of the Mid-South Post Graduate Assembly in session at Hotel Peabody, Memphis, Tennessee, February 9-12 inclusive. The Assembly is successor to the Tri-States Medical Association which for 47 years has held its annual conventions at Memphis.

The Assembly program just completed contains the names of some of the leading doctors of the United States, men who are authorities in their respective fields. The program has been arranged with the view of interesting alike the specialist and the man in general practice.

Following the policy of the Tri-States Medical Association, the Assembly has gone outside its membership for the lecturers and essayists on the program. They are drawn from all parts of the country. The only member of the Assembly who will be among the speakers is the president, Dr. A. G. Payne of Greenville, Mississippi, whose address will be made at the annual banquet.

Dr. Morris H. Fishbein of Chicago, editor of the Journal of the American Medical Association, will be the after dinner speaker at the banquet, following Dr. Payne. Dr. Fishbein's subject will be "Food Fads and Follies." He will discuss some of the strange notions in the field of diet, and will outline some of the work of the American Medical Association's committee on foods in investigating the claims made for certain food products.

Lecturers who will appear on the morning and afternoon programs of the Assembly are Dr. Vilray P. Blair, St. Louis; Dr. Chevalier Jackson, Philadelphia; Dr. Martin H. Fischer, Cincinnati; Dr. John F. Erdman, New York; Dr. Charles L. Scudder, Boston; Dr. Harold G. Jones, Chicago; Dr. Irvin Abel, Louisville; Dr. John J. Moorhead, New York; Dr. Ralph Pemberton, Philadelphia; Dr. Ross McPherson, New York; Dr. Sanford R. Gifford, Chicago; Dr. J. C. Litzenberg, Minneapolis; Dr. H. R. M. Landis, Philadelphia; Dr. Harry A. Fowler, Washington; Dr. L. W. Deau, St. Louis; Dr. William R. Cubbins, Chicago; Dr. Wilburt Davison, Durham, N. C.; Dr. Kenneth M. Lynch, Charles-

ton, S. C.; Dr. A. M. Barrett, Ann Arbor, Michigan; Dr. Charles A. Elliott, Chicago, Dr. F. T. Lord, Boston; Dr. Paul D. White, Boston.

The committee arranging this program is headed by Dr. Richard C. Bunting, Memphis and includes the following members, all of Memphis, Dr. J. A. Crisler, Jr., Dr. J. L. McGee, Dr. Conley H. Sanford, and Dr. A. I. Cooper, secretary-treasurer of the Assembly.

With the change in its name adopted at the convention of the Tri-States Medical Association last February, the Mid-South Post Graduate Assembly extends an invitation to doctors and students of medicine throughout the South and Southwest to enroll as members. Registration at the February meeting of the Assembly carries with it the right of membership.

Dr. Bunting as chairman of the program committee and Dr. Cooper as secretary of the Assembly, join in the statement that the Assembly will live up to its name. The program is a full one, they declare, and the doctors and students of medicine who attend the meetings will be given a four-days intensive post graduate course of lectures by leaders in the profession. There will be no break in the program for golf tournaments or other entertainment features during the daylight hours. The entertainment program will be confined to the annual banquet and to a buffet supper at the Memphis Country Club. Luncheon meetings of different groups with visiting speakers will be featured each day.

Introduction of the speakers on the morning and afternoon programs will be made by doctors of the Mid-South instead of by the chairman as has heretofore been the rule. This is a new feature and marks the broadening of the Assembly's policy to match its larger field of service.

Attendance will include representatives of every state in the south and southwest and a number of states in the north, Dr. Cooper predicts. He is looking for an even larger registration than marked the conventions of the Tri-States Association in the last three years. This means that more than 1,000 are expected to register for this first meeting of the Mid-South Post Graduate Assembly, which takes its place among the most important medical bodies in the country.

The executive committee of the Assembly includes the officers and the following committee chairmen: program, Dr. Richard C. Bunting, Memphis; memoirs, Dr. W. S. Anderson, Bonneville, Mississippi; constitution and by-laws, Dr. E. C. Ellett, Memphis; entertainment, Dr. Louis Levy, Memphis; exhibits, Dr. Gilbert Levy, Memphis.

## THE SINTON TREATMENT FOR MALARIA

The Sinton Treatment for Malaria has the advantage of requiring only a week for the completion of the treatment and its technique has been furnished by Dr. Stratman-Thomas of the Malaria Research Department of the Rockefeller International Health Division.

The treatment consists of two solutions and the basis of each dose is as follows:

### Mixture "A" (23 doses required)

Sodium bicarbonate	60 grains
Sodium citrate	40 grains
Calcium carbonate or chloride	3 grains
Water to make	1 ounce

### Mixture "Q" (21 doses required)

Quinine sulphate	10 grains
Citric acid	30 grains
Magnesium sulphate	60 grains
Water to make	1 ounce

The patient is given 3 grains of calomel when first seen, followed by one dose of one (1) ounce of magnesium sulphate in one (1) ounce of warm water. After this preliminary purge has acted the patient is given one ounce of mixture "A" repeated one and two hours later. One-half hour after the 3rd dose of "A", one ounce of mixture "Q" is given.

Doses of mixture "Q" are given 3 times a day for a week, in every case being preceded by a dose of mixture "A", given one-half hour before.

In addition, the patient is daily once given 1-4 grain of plasmodochin after food during the same week.

Vomiting is frequently checked by the use of the alkaline solutions. In severe cases he gives 20 minims of 1:1000 adrenalin by mouth, repeating if necessary.

**Prophylaxis of Measles with Normal Horse Serum.** — Mazziotti endeavored to ascertain whether the prophylaxis of measles such as was obtained by Pontano in healthy children by the use of normal horse serum could be secured likewise in sick hospitalized children, with a view to arresting a grave hospital outbreak. Two experiments were carried on simultaneously in 1929 in the pediatric clinic and in the "Bambin Gesù" Hospital in Rome, with good results (in the first experiment, about two thirds of the children were exempt while one third exhibited prolonged incubation; in the second experiment twenty-four out of thirty-six were exempt, while eight presented prolonged incubation). The partial success attained would have been, in all probability, total, if in place of the small doses employed (from 5 to 7 cc., in agreement with Pontano's suggestions), stronger doses had been administered.



## ORIGINAL ARTICLES

GASTRO-INTESTINAL AND BILIARY  
TRACT SYMPOSIUMTHE CLINICAL AND SURGICAL AS-  
PECTS OF DISEASES OF THE  
BILIARY TRACT\*

FRANCIS M. MASSIE, M. D.

Lexington.

The title of this brief survey is significant because it emphasizes the importance of diseases of the liver as well as diseases of the gall bladder and extra-hepatic ducts. For many years the gall bladder and extra-hepatic ducts have occupied the center of the stage, a position of prominence which would certainly have been emphasized out of its true perspective by the recent advances of cholecystography, had not our attention been partly drawn to studies of liver function. Recent studies have shown us the importance and often the necessity of knowing something of liver capacity before we undertake the cure or relief of patients with biliary tract disease.

Even the little we know of the many and varied functions of the liver encourages us to continue in this line of investigation with the belief that in this direction we shall one day find the answers to many of our problems dealing with grave metabolic disorders.

When we consider the remarkable regenerative powers of the liver, and realize that it may function competently when eighty per cent or more has been destroyed by disease or experiment, we conclude that as yet we can know little of its function from any one test or series of tests, but at the same time we see how wide a margin of safety nature has provided for us in this protean organ.

We know that the liver is the sole controller of the supply of glucose in the blood; that in the formation of bile it excretes bile salts, cholesterolin, and urobilin; that it converts amino acids not used by other tissues to urea, and burns up uric acid; that it desaturates and stores the fats; in this laboratory is formed fibrinogen, and it is possibly a depression of this function in conditions associated with jaundice which may account for the delay in coagulation time of the blood. Recent work has shown that the liver is intimately associated with and perhaps controls water balance in the body, its absorption and release to the tissues; and something of its role in the metabolism of iron and copper has been known for a long time. The knowledge that the liver is a detoxicant for certain of the mineral poisons suggests the fas-

cinating assumption that it also supplies antibodies to bacterial toxins and other proteins. And it has been suggested that it even manufactures hormones which activate the vital centers of the mid-brain.

From the little we know of liver function and from the much we half-know and guess we can see that it is "A complex laboratory, capable of metabolic, excretory, and detoxicating functions, being endowed with a large power of reserve. In disease any one of these functions may be interfered with. Only in severe states, phosphorus, arsenic or chloroform poisoning, or in acute yellow atrophy may these functions be simultaneously involved."

The value for us in a study of liver function lies chiefly in the help it gives us to understand the relation between gall bladder disease and liver damage, and this understanding helps us to prepare our patients properly for surgery, when operative intervention becomes necessary.

The important questions which arise in dealing with patients who have symptoms referred to the upper abdomen are; has this patient disease of the gall bladder, or is it some other intra-abdominal disease, or is the disturbance an abdominal manifestation of cardio-vascular disease? If the disease is definitely in the biliary tract what relation has it to liver damage and what tests can best show us this relation? What is the value of cholecystography, and is it a sufficient guide to operative interference? Is there any medical treatment for gall bladder disease, and in what ways may we best prepare our patients for operation? What types of operation do we employ and what special post-operative care should they receive? We do not presume to think that we can answer all of these questions correctly in each instance, but we insist that no patient has received proper care until his doctor has considered each of these questions carefully, and earnestly tried to answer them.

In determining the presence of biliary tract disease no laboratory test can take the place of a careful history and physical examination. We have all seen patients with "indigestion," nausea, vomiting, upper abdominal pain, a "muddy" complexion, a low-grade febrile temperature, and a tender mass in the right upper part of the abdomen, whose cholecystogram shows a faint or absent shadow, and yet these patients are found to be suffering from congestive heart-failure and not from biliary tract disease at all. How often we see a patient who suffers with attacks of agonising pain in the upper right quarter of the abdomen, coming on suddenly after eating, the pain radiating to the back and shoulder. Usually this is "gall stone

\*Read before the Kentucky State Medical Association, Lexington, September 7-10, 1931.

colic," but it is wise to remember that it may be due to "angina."

The importance of cholecystography after the oral or intravenous administration of dye is great. We have had no single laboratory test so helpful in the diagnosis of "border-line" cases, but we do not consider that every patient with a vague history of "indigestion," who shows a faint or even an absent gall bladder shadow, should be submitted to surgery. We believe that many of these patients can be relieved by a bland, fat-free diet, and trans-duodenal gall bladder drainage two or three times a month, or more often, over a period of several months. My own experience with patients whose symptoms have been indefinite, and whose Graham-Cole tests have shown faint shadows, has convinced me that most of these patients do not get relief when their gall bladders are removed. It has been recently stated by one of the surgeons in a large teaching clinic in the east, that in his experience eighty per cent of patients who had had cholecystectomy done where no stones were found were not benefitted by the operation.

The most satisfactory tests of liver function are the dye tests and the estimation of serum bilirubin. The "glucose-insulin-water" tolerance test worked out by Althausen and Kerr may prove to be a valuable addition in determining liver damage. It is so simple that anyone with access to a clinical laboratory may make use of it regularly. Of the serum bilirubin tests the icteric index is chiefly useful in patients with "latent" jaundice, and in noting the progress of a jaundiced patient. The Van den Bergh test determines for us the type of jaundice, whether obstructive or non-obstructive in origin. Graham, Cole, and Copher claim that the blood serum determination of their cholecystography dye is an accurate index to liver damage, the serum showing retention of the dye in ninety per cent of patients with biliary tract disease.

The regenerative power of the liver on a high carbohydrate intake is the basis of our pre and post-operative treatment. Especially when associated with jaundice do we flood these patients with sugar. When they can not take it by mouth we give it to them by vein. It has been shown that when a ten per cent solution of glucose is given in the vein by the ordinary "interne method," sixty per cent of it is excreted by the kidney. But when this solution is given by the method of continuous intravenous drip practically all of the glucose can be stored by the liver. Ordinarily in preparing patients for operations on the gall bladder and bile passages we do not submit them to intravenous therapy, but the acutely ill or jaundiced pa-

tient is often saved only by this procedure. It is useless to give glucose solution by rectum, as it has been demonstrated over and over again that none is absorbed except the small amount which runs past the cecum into the ileum, and the glucose in the solution delays the absorption of water from the colon.

Walters has recently shown that the administration of calcium chloride in the vein does decrease the coagulation time in jaundiced patients. We give this in the manner suggested by Walters, 1 gram of calcium chloride in 100 cc of normal saline daily for three days preceding operation. The dilution avoids the unpleasant reaction following the use of the ten per cent solution.

The patient with acute cholecystitis or cholangitis with jaundice, presents the gravest risk. We feel, with most others, that waiting is the wisest course, certainly waiting as long as the patient improves on rest and a high fluid and carbohydrate intake. If the condition becomes worse in spite of this supportive treatment, we are forced to intervene. This class of patient aptly illustrates the paradox that "the very gall bladder which should be removed is the very one we can not remove." It is here that we have found the cautery useful in destroying most of the gall bladder without opening up lymph channels for absorption, and without attempting to ligate the cystic duct.

In the ordinary course of gall bladder disease when we think an operation is indicated we do not believe in temporizing by simply draining the gall bladder, unless removal is contra-indicated by some very grave condition.

All of the patients in our clinic receive large amounts of glucose and saline by vein after the operation, and as soon as tolerated a high carbohydrate, low fat diet.

In summary:

1. No patient should be operated on for biliary tract disease until some effort has been made to determine the liver function.
2. Many patients with mild symptoms should receive medical treatment and no surgery, in spite of a Graham-Cole test showing no shadow.
3. Glucose in large amounts by continuous intravenous drip should be given to prepare the "grave risk" patient.

**Roentgenography in Direct Diagnosis in Addison's Disease.**—Thompson urges that roentgen examination of the suprarenals should always be conducted in cases of Addison's disease, because when a positive result is obtained it gives the only direct evidence of disease of the suprarenals.



CLINICAL AND SURGICAL ASPECTS  
OF DISEASES OF THE DUODENUM\*

MALCOLM THOMPSON, M. D., F. A. C. S.

Louisville.

The duodenum is the first portion of the small intestine being continuous with the stomach superiorly and the jejunum inferiorly. It "has received its name from being about equal in length to the breadth of twelve fingers. It is the shortest, the widest, and the most fixed part of the small intestine, and has no mesentery, being only partially covered by peritoneum." The pancreatic duct and the common bile-duct open into the duodenum. The coats of the duodenum are four—serous, muscular, areolar and mucous. Within these coats are contained valvulae conniventes, intestinal xilli, glands of Lieberkuhn, glands of Brunner and solitary lymphatic nodules. The entire organ is richly supplied with arteries, veins, lymphatics, and nerves.

The function of the duodenum is to receive the contents of the stomach, the pancreatic and biliary secretions, and initiate the processes of intestinal digestion. By its peristaltic action, the duodenum empties its contents into the jejunum.

The symptoms of duodenal disease are abdominal pain and discomfort, flatulence, loss of appetite, nausea, vomiting, loss of weight, blood spitting, and the passage of blood in the stools. When a patient complains of any of the above symptoms, a complete medical history should be taken as the history and the roentgen ray findings are of greatest importance in diagnosing duodenal lesions. A thorough physical examination should be made with particular attention to areas of tenderness, visible peristalsis, and involvement of the central nervous system. The nervous system is of importance because tabes dorsalis at times simulates duodenal disease and because of it, unnecessary and harmful operations have been performed. An urinalysis, complete blood count, blood Wassermann, and a gastric analysis should be done. If there has been vomiting or a fistula is present the chlorides and non-protein nitrogen of the blood and the carbon dioxide combining power of the plasma should be determined for in these conditions the chlorides are lowered, the non-protein nitrogen greatly increased, and the carbon dioxide combining power increased. Little, if any, importance should be attached to a single gastric analysis as this test is of value only when repeated and constant findings are obtained. A roentgen-ray examination with the barium meal is then made. De-

formity of the duodenal cap, six hour gastric retention, and gastric hypermotility are evidences of ulcer. Distention of the descending and horizontal portions are present when there is obstruction in the third and fourth divisions of the duodenum. In acute conditions, some of these examinations must necessarily be omitted. With the data obtained from the above examinations, one is qualified in the majority of cases to decide whether duodenal disease is or is not present. The conditions most likely to be found are congenital defects, tumors, acute obstruction, chronic stasis, diverticula, duodenitis, wounds, ulcer, and fistula.

The congenital defects are stenosis, diverticula, and abnormalities of position, length, and size. The duodenum is normally U-shaped and composed of four portions. V-shaped and C-shaped duodena are sometimes found but they seldom if ever give rise to symptoms. The diameter of the duodenum is 3.75 to 5 cm. while that of the jejunum is 3 cm. Both of these organs are subject to considerable variation in diameter, the duodenum being considered normal up to a width of 6 cm. Excessively wide duodena are found, but they do not give symptoms unless the great width is due to obstruction, or unless the jejunum is smaller in proportion than is normally found. The duodenum is subject to variation in position in that the transverse portion is found lower than the lower border of the third lumbar vertebra, its normal position. When transposition of the viscera is present, the duodenum is found upon the left side of the body. Variations in length have also been reported some of them being twice the normal.

Tumors of the duodenum are rare. The symptoms they provoke simulate as a rule duodenal ulcer. Occasionally they are diagnosed preoperatively because of the defect observed with the roentgen-ray and barium meal. The ones which have been found are myoma, fibroma, myxoma, angioma, adenoma, lipoma, and carcinoma. The treatment of duodenal tumors is surgical excision.

Acute duodenal obstruction is characterized by prostration, distention, and frequent vomiting. It is part of the condition described in the text-books as acute gastric dilatation. It is observed more frequently in stout subjects than in thin ones and occurs following operation, injuries, and child-birth. It is thought to be due to pressure of the superior mesenteric vessels upon the transverse portion of the duodenum caused by lying too long and relatively motionless in the supine position. The treatment is gastric lavage and change of position, preferably to the prone position.

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

Chronic duodenal obstruction causes pain, nausea, vomiting, distention of the upper abdomen, toxic manifestations, the most frequent of which is headache, loss of weight, and constipation. It can sometimes, but not always, be diagnosed with the roentgen-ray. It is caused by adhesions and compression. It is likely a more common condition than is usually discovered. I have seen two cases, one in a child 8 years old, and the other in a young woman, 30 years old. "Adhesions causing obstruction have come from the stomach, gall bladder, cystic duct, liver, transverse mesocolon, ascending colon, and posterior parietal peritoneum. These adhesive bands may be due to disease of neighboring organs, but for many of them no cause can be found. They are at times in association with other pathologic conditions such as duodenal ulcer. Compression of the duodenum is caused by the pedicle of the superior mesenteric artery or by the middle colic artery pressing the third part against the posterior abdominal wall." The treatment of chronic stasis should at first be medical and consists of posture, diet, and abdominal support. If this fails following a sincere trial laparotomy is indicated. When adhesive bands are present, they should be excised and omental grafts placed over the remaining raw surfaces. If there is pressure due to the superior mesenteric artery, a duodeno-jejunostomy should be performed. If the middle colic artery due to a prolapsed right colon is the cause of the obstruction, the colopexy of Waugh gives excellent chances for relief.

Duodenal diverticulum is not common. It may be congenital or acquired. It is often symptomless and when it does give symptoms, it resembles duodenal ulcer. It can usually be demonstrated by the roentgen ray. When symptoms are troublesome, the treatment is surgical excision.

Duodenitis is seldom of clinical importance. It may be caused by irritating substances such as impure food, alcohol, toxins from distant focal infections, or actual bacterial invasions. The treatment is rest, hot fomentations, and a bland diet. Severe protracted cases demand pyloric occlusion and gastro-enterostomy.

Wounds of the duodenum are caused by knives, bullets, motor car wheel, and other forms of trauma. Surgical operations upon the right kidney, transverse colon, and hepatic flexure have sometimes been the cause of duodenal wounds. The treatment is surgical suture plus an omental graft. Duodenal wounds lead to duodenal fistula. Following pylorectomy or other operations upon the duodenum extremely careful suturing is necessary to prevent the formation of fistula. Due to the digestive action of

duodenal secretions upon animal tissues, it is wise to use a non-absorbable suture in at least one layer when closing the duodenum. The line of suture should also be protected with an omental graft. Once a fistula is present, the treatment is suction as recommended by Lahey or dressing the wound with N/10 hydrochloric acid, beef juice, and olive oil. What duodenal secretion is not neutralized by the acid digests the beef juice and oil rather than the patient's tissues. If the fistulous patient is losing fluid more rapidly than it can be given, a jejunostomy is indicated and should be done without delay.

Ulcer is the most important and most frequent lesion of the duodenum. It usually occurs in the first portion of the organ, it may be single or multiple, and it is often associated with gastric ulcer, diseases of the biliary system, appendicitis, and other intra-abdominal conditions. It may be acute or chronic. The exact etiology of it is unknown though there are, at times, evident contributing factors such as toxemia and bacteremia due to focal infections, burns, dietary and other indiscretions. The most frequent symptom is pain in the upper right abdomen. This pain often comes on two to four hours after last taking of food and it is usually relieved by the taking of food or alkalis. Hemorrhage is sometimes a symptom, and may be the only one. Diarrhea is said to be a symptom, but I have never seen it except when associated with large hemorrhages.

In its early stages and when there are no complications, the best treatment of duodenal ulcer is medicinal. This consists of rest, relief from worry, abstinence from tobacco and alcohol, the administration of alkalis and belladonna, and diet. Two of the most popular diets are those of Lenharz and of Sippey and they are too well known to be described here. I have found Alverez's plan eminently satisfactory. Three meals each day are chosen from a "smooth-diet" list which is given to the patient. The essential element of the treatment is the food between meals. In the morning, there is made up a mixture of one quart of milk, two eggs, and either a gill or half-pint of cream, depending on the patient's need for extra calories. If milk is not well tolerated, a certain amount of thin gruel made from any cereal may be submitted. Breakfast is taken at 7:30, lunch at noon, and dinner at 6:00. A glassful of the mixture is taken at 10:00, another at 2:00, one at 4:00, one at 8:00, and another at 10:00. Rarely are alkalis necessary in addition to this regime.

If after adequate medical treatment, the ulcer becomes chronic and the symptoms persist, surgical operation is advisable. Other indications for operation are the com-



plication of duodenal ulcer. There are perforation, hemorrhage, and obstruction. Operations, in the presence of a high acidity are not to be recommended unless absolutely necessary as post-operative symptoms and gastro-jejunal ulceration are likely to be unpleasant sequelae. Perforation and hemorrhage may be acute or chronic and both may come on without previous warning. Unless indications are definite, very young patients should not be subjected to operation.

Acute perforation is characterized by severe pain, prostration, and board-like rigidity. I have seen acute cholecystitis in a highly nervous person simulate duodenal perforation, and I have seen perforation mimic acute appendicitis. The latter may occur when the opening is near the right anterior border of the duodenum and the secretions travel down the right para-colic fossa to reach the abdominal parietes near the cecum. The treatment of acute perforation is immediately surgical with suture of the perforation plus an omental graft. If obstruction is present, a gastro-enterostomy should be done in addition, but this will seldom be necessary. Chronic perforation leads to chronicity of symptoms in spite of good medical care and the treatment is surgical.

Acute massive hemorrhage is manifested by sudden prostration, acute anemia, hematemesis, and melena. Small hemorrhages are determined by examining the stools for blood. Anemia is of course a natural consequence.

Acute massive hemorrhage is treated by absolute rest of the gastro-intestinal tract, ice caps to the duodenal region, morphine subcutaneously to allay fear, blood coagulants subcutaneously, and small amounts of glucose and saline either by hypodermoclysis or intravenously. Small transfusions of whole blood are also valuable. Repeated hemorrhages necessitate surgical procedure.

Obstruction is due to actual stenosis at the site of the ulcer or to spasm of the pylorus because of irritation. It leads to nausea, vomiting, dilatation of the stomach, weakness, loss of weight, and constipation. If belladonna and other medical measures fail to relieve it, operation must be performed without delay. Repeated gastric lavage and the par-oral administration of glucose and chlorides should be employed in preoperative preparation.

The type of operation indicated for acute perforation has been stated. For the other indications, which is the most suitable surgical procedure? That is a question exceedingly difficult to answer and one about which there is much controversy. Time will not permit a thorough discussion this morning of the merits of each operation and their

indications. The principles upon which surgery of duodenal ulcer is based are to remove the ulcer, reduce to a minimum the physiologic activity of the involved area, and facilitate the neutralization of gastric acidity by the duodenal secretions. Any operation which does not satisfy these principles will likely fail. In all operations, careful search with proper treatment must be made for multiple ulcers, ulcers upon the posterior wall, and for associated disease such as cholecystitis, appendicitis, diverticulitis, and pancreatitis.

In performing anastomotic operations between the stomach and intestine, extreme care must be exercised to see that the duodenum or proximal jejunum is used. A number of cases have been reported in which surgeons have joined the stomach to the ileum mistaking it for the jejunum. The patient's second state is then much worse than his first.

A surgeon who undertakes to operate for duodenal ulcer should acquaint himself with all of the usual surgical procedures and should apply the one to each case that gives the best chance for cure with a reasonable minimum risk. The end results are to a large extent dependent upon the care exercised in selecting patients for operation and the willingness of the patient to avoid indiscretions following operation. The more definite the indications for operation, the greater the opportunity for relief. With proper selection of patients and careful attention to operative principles, a successful result may be expected in approximately 87 to 90% of cases.

The pathology of the duodenum is distinctive and though there are many points of similarity, its pathology is quite different from that of the stomach, the jejunum, and the ileum. How then the word peptic has been retained to designate a lesion of either the stomach or the duodenum is difficult to understand. The use of the term, peptic, is improper from an anatomic physiologic and pathologic point of view. Its use has resulted in an enormous amount of confusion concerning the natural history and treatment of lesions of the stomach and duodenum. The most important abnormality of the duodenum is ulcer, which probably never becomes malignant, and primary malignancy of the duodenum is one of the rarest diseases of the entire gastro-intestinal tracts. The most important abnormality of the stomach is carcinoma, which is thought by many to correctly differentiate gastric ulcer and it is practically impossible before operation to correctly differentiate gastric ulcer and gastric carcinoma, and it is often difficult to differentiate them when the lesion is in

ones hand, and is being grossly inspected. Many physicians, I am sure, think ulcer of the stomach and duodenum are much alike because of the use of peptic to describe both conditions. The two are so different in their end results and treatment, it is unwise to consider them as related lesions. The treatment of duodenal ulcer is primarily medical and secondarily surgical, while the treatment of gastric ulcer is primarily surgical as soon as the diagnosis is made.

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**Simultaneous Occurrence of Bronchial and Rheumatic Diseases: Significance of Allergic Factors in Both Diseases.**—Gehlen and Otto observed that many patients who had asthma also showed symptoms of rheumatism. In order to determine whether the same etiologic factors are found in the two diseases, they made cutaneous tests with mold fungi in patients. Positive reactions were found not only in most persons who had bronchial disturbances and rheumatism but also in those who showed only rheumatic symptoms.

## THE CLINICAL AND SURGICAL ASPECTS OF DISEASES OF THE STOMACH\*

ROBT. P. BALL, M. D.

Harlan.

The stomach in man belongs to the simple type as distinguished from the compound stomachs of some of the other mammaliae. Physiological and histological investigations have shown that the simple stomachs are divided into parts that have different properties and functions. Some authors divide the stomach on an anatomical basis, but for practical consideration it is more convenient to divide it on a physiological basis. The division of the stomach into pylorus, body and fundus is sufficiently descriptive for clinical discussion if we appreciate the common variation of any fixed anatomical landmark. There is enough distinction between these regions of the stomach both anatomically and physiologically to suggest significant physiological alterations when one or the other portion is impaired in its function.

Experimental investigation of the movement of the stomach reveals a complicated muscular arrangement controlled by three sets of nerves. It has been demonstrated by Cannon that the stimuli to the stomach in the process of digestion are of three types, mechanical, chemical and psychical. It is upon the basis of these observations that we begin to interpret the clinical manifestations of gastric function. The correlation of a detailed gastro-intestinal history is not possible without a fair knowledge of the normal physiology. The surgical management of gastric lesions is successful only when based upon physiological standards. For this reason I shall take some of the brief time allotted me in this symposium to recall to your memory the nerve innervation of the stomach.

There are two sources of extrinsic nerve fibers, the vagus and sympathetic. It is thought that there is both motor and sensory fibers in both nerves. In general the vagus is considered to be the motor nerve and when stimulated there is seen marked contraction of the entire musculature of the organ. Stimulation of the sympathetic nerve will mainly produce dilatation or inhibit muscular contraction. Section of both vagi and sympathetic nerves, reveals that the stomach is an automatic organ and not dependent upon its extrinsic nerves for its automaticity. The plexuses of Meissner and Auerbach are possibly the source of this automatic mechanism, however it might be responsible for the automatic

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.



action. Cannon showed that there was a cessation of muscle contraction when fright, rage and etc., was produced into the cat. The mechanical stimuli are observable by the different reactions to fluid and solid food. The chemical stimuli are noted by varying the acidity. The response of the stomach to the nerves impulses are of the utmost importance to the clinician when he attempts to correct functional disorder.

Heretofore the medical literature has referred to hyperacidity, hypoacidity, achlorhydria, etc., as denoting variations in the normal secretory functions. The pathological classifications have included hyperemia and gastritis. Unfortunately the term gastritis with its descriptive adjectives acute, chronic, chemical etc., was apparently based upon theory more than actual observation. Since the stomach has become a not uncommon site for surgical intervention and visual inspection we have discovered the extreme rarity of simple gastritis. Recent observations by the roentgenologist and surgeons have exemplified the importance of the motor mechanism in producing gastric distress. It is not the extent of gastric pathology which determines the clinical symptoms, but the location of the pathology and its effect upon the motor mechanism. The medical literature of today is emphasizing the gastric phenomena of such diseases as pulmonary tuberculosis and hyperthyroidism. The effect of pulmonary tuberculosis is thought to be manifested mainly through the vagus nerve an example of afferent visceral stimuli. The effect of hyperthyroidism is possibly through the sympathetic nerve and plain muscle of the stomach. The dilatation of the stomach and gastric symptoms following abdominal operations not concerned with the stomach are further examples of visceral afferent impulses affecting the motor mechanism of the stomach. The same phenomena following severe trauma of distant parts of the body illustrate the somatic afferent impulses. The nausea and vomiting associated with emotionalism such as following the sight of blood or a ghastly wound is an example of afferent impulses psychic in origin. The gastric symptoms accompanying gall bladder disease, notably belching and gas formation are not proven at the operating table, to be mechanical in origin. Improvement in the medical and surgical treatment of gastric symptoms will be in direct ratio with our increased knowledge of the normal response of the neuro-muscular mechanism of the stomach.

The common terms for stomach symptoms are indigestion and dyspepsia, but the majority of patients will give as their chief complaint "stomach trouble." Oftentimes

this does not signify pathology in the stomach but it is usually an accurate statement in that the patient has his particular disease manifesting itself chiefly through interference with the normal physiological functioning of the stomach. Upon further questioning considerable information can be had with reference to pain and intake of food, blood in vomitus, duration of illness etc. But the anamnesis will not be very typical in early gastric lesions. Regardless of the detailed analyses of verified gastric lesion anamneses I find the eminent gastro-enterologists, internists and surgeons in about the same state of uncertainty, possibly more uncertain, than the senior medical student, before x-ray study and abdominal exploration. And in the x-ray study of the stomach it is interesting to note the stress laid upon the motor mechanism by the roentgenologist in his interpretation.

The surgical aspect of stomach disease is so entirely dependent upon the particular problem presented upon opening the abdomen it is difficult to make any definite statement. In neoplasms complete excision is always done and when possible the lymphatics are removed. Unless the excision is done before metastasis the operation is merely palliative. The most common operative procedure in neoplasm is gastro-jejunostomy, Billroth II or Polya. Complete excision is done occasionally. The greatest possibilities in gastric surgery lie in peptic ulcer. The acute perforated ulcer is an emergency dealt with intelligently at the table with only one aim in view and that is to save the patient's life. This usually means a rapid closure of the perforation with the method one can use best and adequate drains. The patient is treated for peritonitis.

In handling of a gastric ulcer there is a very interesting observation in medical literature. In general there is a definite trend to a more so-called radical excision. This term implies the removal of a considerable segment of the stomach. The pre-pyloric region or pylorus is the portion usually removed with the ulcer crater. It is reported that the adoption of more radical types of surgery has resulted in permanent cures. The term permanent cures refers to patients free from clinical manifestations of gastric disease. To date there is not sufficient data in medical literature to be positive about the incidence of recurrent ulcer in the various types of operative procedure. It does not require much time to know about the clinical result. The more resection the better clinical result has been fairly uniformly reported. It is interesting to note that a sleeve resection, Billroth II or Polya will completely interrupt the extrinsic nerve supply. It is very

likely that the good results of more radical surgery is due to physiological correction of the organ and not entirely due to the excision of the pathology. It is interesting to recall that recently Dr. G. W. Crile has obtained excellent clinical results upon peptic ulcers by adrenal denervation. These were cases that had had multiple operations without relief.

In conclusion I wish to emphasize the role of the neuro-muscular mechanism of the stomach in producing symptoms of gastric distress. The dependency of the roentgenologist on the motor mechanism in his diagnosis, the slowly evolved majority of opinions among surgeons regarding the type of operation for gastric ulcer and how completely the operation more nearly restores normal motor function, and the unreliability of stomach diagnoses from the anamnesis alone.

#### DISCUSSION

**Irvin Abell, Louisville:** We have listened this morning to most interesting papers in this symposium. I think the feature that will strike most of us at once is the outstanding study in physiology which has been manifested in their preparation, particularly in the physiology of the liver in connection with the pathological aspects of the latter as the result of disease, and the physiology of the stomach in the last paper, illustrating that the progress which we are to make in surgery as well as in medicine in the future must come along physiological as well as along biochemical lines.

The extent of the papers presented makes it impossible for one to devote attention to more than one or two phases. I shall utilize the remaining minutes of my time in elaborating some of the points and principles made by Dr. Thompson in discussing the surgical treatment of duodenal ulcer. The attainment of success in the surgical treatment of duodenal ulcer is dependent upon three factors: (1) the proper selection of patients for operation; (2) the proper choice of operation for the individual patient; (3) efficient pre- and post-operative care.

Regarding the selection of patients for operation there has been much discussion in the past, possibly some of it acrimonious, between the surgeons and the physicians to which patient should be subjected to operation. Dr. Thompson has been eminently fair to both parties, I think, in stating that perforations, whether acute or chronic, whether open or sealed, obstructions of the pylorus, and ulcers presenting repeated hemorrhages, should be subjected to operation.

I should like to elaborate just a moment upon the types of hemorrhage indicating that the patient is one that would fall into the operative group. Hemorrhage from duodenal ulcer clinically occurs in one of three types. First, as

a single massive hemorrhage which immediately threatens the life of the patient, and here I am sure Dr. Thompson would agree with the statement that this patient is not one for operation but is to be treated by the means which he has suggested. Second, where the hemorrhages are repeated, occurring in visible amounts either by mouth or bowel, in 30 per cent of duodenal ulcers they do, and in such amounts as to deplete the vitality of the patient, operation is indicated. In the third clinical type also mentioned by him, in which the blood is not visible either by mouth or bowel, but does show microscopically and is of sufficient quantity to keep the patient constantly anemic, regardless of medical treatment, this patient should be subjected to operation.

Finally we come to the group which he mentioned as those patients that have had the benefit of medical treatment without effecting a cure of the ulcer. I am sure all of the medical men will agree upon operation in the three groups that have been mentioned, those characterized by perforation, by hemorrhage, and by obstruction.

It is in the fourth group in which there is no repeated hemorrhage in which no sealed perforation exists, in which the patient presents merely the evidence of a dyspepsia, that the discussion has come about. I think it has been perfectly fair to state that these patients are to be given the benefit of medical treatment, when if not relieved, chronicity becomes an indication for operation; such patients having failed to find relief from medical treatment should be given the advantage which surgery has to offer.

In making a choice of operation for the individual, the second factor upon which success depends, one who attempts to operate, as Dr. Thompson said, upon duodenal ulcer should be familiar with the various procedures and the surgical principles which underlie its treatment. If I may elaborate upon this point, I would state that in our own personal experience there have been three operations that have been of outstanding benefit. One is the pyloroplasty either of Finney or of Mikulicz. This operation is suited only to those cases in which the ulcer is on the anterior or superior duodenal wall and in which the duodenum is freely mobile or can be readily mobilized so as to bring it readily into the wound and make it susceptible to surgical attack. The operation has the advantage in that the end result more nearly approaches physiological conditions than any other. It also permits of the excision of ulcers in this location.

The second conservative measure that has been of tremendous value has been the destruction of the ulcer with the cautery, after the suggestion of Balfour, combined with a posterior gastroenterostomy. We have discarded doing posterior gastroenterostomies alone, for the



reason that the ulcer requires time to heal, that there are still left opportunities for perforation—and seven per cent of them do perforate, that there are still left opportunities for hemorrhage, and, as stated before, thirty per cent of them bleed. The destruction of the ulcer at the time of operation by the cautery is a safe thing to do; it eliminates the ulcer from future consideration and leaves the subsequent gastroenterostomy to give the patient such protection as may be had from recurrence.

The third type of operation that we have employed has been the resection of the pylorus and duodenum, not with the idea, suggested by Pfister, of reducing gastric acidity, but because experience with certain local pathology showed that we had undesirable results from the simpler and more conservative measures.

Duodenal ulcers are multiple in five to six per cent of cases. Ulcer on the posterior wall does not lend itself to destruction by the cautery or by excision, consequently must be left to heal. An ulcer that is perforated, for instance, and is sealed by adherence to the liver, the gastro-hepatic omentum, or perforated into the head of the pancreas, does not heal by a simple posterior gastroenterostomy. In our earlier experience we tried that, and found those patients coming back to us with a continuation of the symptoms of dyspepsia, hemorrhage, chronic pancreatitis, and even with malignancy of the head of the pancreas engrafted on it. For these reasons we have adopted a more radical resection, taking out the pylorus and the portion of the duodenum involved—a radical operation, but with definite indications for its employment.

The third factor is the essential pre-operative and post-operative care. Many of these patients are anemic, have not had adequate food or nourishment, have suffered over a long period of time, and particularly require pre-operative care. Those with dehydration and those with acidosis, require particular care in their preparation; those with obstruction about the pylorus that have shown considerable nausea and vomiting, often have, instead of an acidosis, an alkalosis in which there is a decrease in the chlorides in the blood plasma and an increase in the carbon dioxide, requiring directly opposite treatment from those that present an acidosis. The blood chemistry reveals the indication, and the safety of the operation is tremendously enhanced by appropriate treatment: administration of the chlorides in the one instance and the alkalis in the other, with glucose and blood transfusions in both of them. Finally efficient post-operative care.

The mere fact that you have excised an ulcer, that you have excised the ulcer-bearing area of the duodenum and pylorus, or that you have made a ploroplasty or a gastroenterostomy does not mean that you have avoided the pos-

sibility of recurrence. Ulcers recur regardless of the type of operation which one does, they recur at the suture line, at different points on the intestinal wall, and even in the jejunum below the point of anastomosis; consequently, unless efficient post-operative observation, advice and care are given to the patient over a period of at least one year, I do not feel that the treatment has been complete or satisfactory.

**W. O. Bullock, Lexington:** Dr. Abell has stated that it is impossible to discuss these papers in the time we have, so there is only one small part of the whole series that I shall mention, and I shall bring that out because it is perhaps less known and less discussed than most of them. It is the question of duodenal stasis.

The patient I wish to report, a nurse who had had more diseases and more troubles than I would have time to enumerate, was suffering with repeated attacks of headache and profuse vomiting and signs of obstruction. She was visiting her sister in New York when she was taken with one of these acute attacks of supposedly intestinal obstruction. She was operated on there by a surgeon of national reputation, and she recovered for a few months. She came back home, and her symptoms recurred. I opened her up and unraveled a few feet of adhesions, and she was better for a little while.

About that time I ran across some articles on duodenal stasis, and the picture of her disease seemed to fit in with this condition. Her symptoms having become acute, I took her to the operating room, and found a tremendously enlarged duodenum. It was so large that it could easily admit an ordinary eight-ounce glass tumbler. Here I thought was the opportunity to relieve this patient by a jejunostomy or a duodenojejunostomy, which I did. The anastomosis of course, was anti-peristaltic. The line of least resistance for the exit of accumulated fluids from the duodenum was directly through the stomach. She persisted in her vomiting of green fluid and got worse and worse until she was just on the edge of the grave. I took her to the operating room a second time, did a rapid pyloric occlusion and gastroenterostomy. She gradually came back and recovered, to a certain degree, her strength. After seven or eight months she again had a recurrence of her symptoms, and I found that her pylorus had opened. I took her to the operating room for the last time and divided the pylorus and turned it in. Since that time she has led a pretty miserable existence, but she is able to do part time nursing in a sanatorium.

The relaxed, flaccid, enlarged duodenum of this type is certainly not one of obstruction. There is no hypertrophy of the muscles, there is no dilatation such as you get with an acute affair, the condition is evidently the result of defective innervation, and I believe that we have

all been working from the wrong direction on these cases.

As Dr. Abell has stated, we are beginning to use the physiological principles to restore these conditions to their normal state. I think that this condition should be regarded somewhat as a Hirschsprung's disease. I think that the rational and proper treatment consists not in the treatment of the condition as it exists, but in going further back and resecting the appropriate sympathetic ganglion that is responsible perhaps, for this condition.

**Wallace Frank, Louisville:** I want to express my appreciation to the three gentlemen who gave the symposium. The papers have been most excellent, and I think very instructive.

There is one point that Dr. Massie brought out which I do not think he emphasized sufficiently, and that has to do with the value of the Graham-Cole test in the determination of gall bladder disease. When this test was first introduced, we all hailed it as the one means by which we could actually and definitely tell that a patient had a diseased gall-bladder, especially those individuals in whom the symptoms were rather vague. On the basis of this test, the gall-bladder that did not visualize or did not empty in the proper time was subjected to surgery and numerous gall-bladders were taken out. I think no small per cent of those people whose gall-bladder showed little gross pathology are worse off than when they were operated.

In a certain type of individual, especially that one in whom there is evidence of gastroparesis, with vague symptoms of colitis, passage of mucus with the stools, and who has those vague digestive disturbances that we see in gall-bladder cases, we thought this method of investigation would give us definite information as to whether or not the gall bladder was diseased. It is in that very type of individual that, to my mind, this test has but little value. In that type it has been our practice in the last few years, after having had one or two of our own cases come back, and having seen quite a few cases that have been cholecystectomized by other surgeons, to place but little value on the Graham-Cole method of investigation.

There are certain of these cases, I grant you, that we operate, but unless there is absolute definite indication of infection in the gall-bladder, such as the thickening of the wall, the presence of enlarged glands along the cystic duct, or the presence of stones, it has been our practice to let those gall bladders alone. If you drain such cases you are creating a pathological condition that did not exist before you started and which may lead the patient to no end of trouble. If you remove the gall-bladder many will be worse than before operation. Therefore, I want to emphasize what Dr. Massie brought out, that this test is not proof positive. We have seen, on several occasions, individuals

who on three or four examinations showed no evidence of disease, and yet when opened showed gall-stones. We have further seen others in whom no shadow showed on two examinations, and who on the third use of the dye, showed a perfectly normally functioning gall-bladder.

Hence I arise to sound a note of warning to you who put too much faith in this test, and those of you who are doing surgery should have your surgery governed by the pathology found and not by the results of this examination.

**Virgil Simpson, Louisville:** I have enjoyed the papers which the doctors have given, and with much that has been said I find myself in accord.

With regard to the old discussion as to whether or not cholecystectomies are preferable or whether or not cholecystostomies are preferable, we have added another feature of interest in that perhaps some of them ought not to have either. That, I think, is probably one of the most valuable contributions of the morning, that not all gall bladders necessarily are surgical, that sometimes if you let the poor viscus alone, it might struggle through and get well. I personally can see no reason why some diseased gall bladders may not recover, even as other structures in the body recover. One may have pneumonia and get well. One may have endocarditis and get well. One may have many other acute, even sub-acute, inflammatory processes, and get well. Why should the gall bladder be put in a category alone?

I have some very definite feelings concerning the removal of gall bladders as a routine procedure. I think much of routine surgery is bad surgery. I think that the procedure should be determined at the time of its doing, based on the conditions which have been found preceding the opening of the abdomen and then coupled with the information which is obtained by inspection and handling of the organ at the time of the operation. That is the best surgery—determining then what is considered the best procedure, and not merely making up one's mind that gall bladders shall be removed before the abdomen is opened, and taken out regardless of what the general appearance may be or what the possibilities may be.

I am quite sure that the routine removal of gall bladders results in not a few of these cases coming back to the poor internist who has been referred to, with all of the symptoms which drove them originally to the surgeon and which the surgeon, having done his worst, is no longer able to do anything for, and therefore it rests with the internist to struggle with these poor unfortunates. They have much or all of the clinical manifestations which they had preceding the operative work; they have the digestive disturbances, the physical discomfort, they have not gained in weight. The explanation of such a condition not infrequently is rather easily



understood. Just so long as the sphincter holds, that long will the common bile duct establish itself as a reservoir for the bile and become an artificial gall bladder, and so long as the sphincter holds, this common duct, being unnaturally called upon to do something it was not created to do, will lead to more or less disturbances of the digestive tract, so-called dyspepsias. That is bad enough for the patient, but so soon as the sphincter ceases to function and lets go, as it sometimes does, then develops a diarrhea that a half dozen doctors, including our surgical friends, are not able to control.

Just a word as to visualization of the gall bladder under dye by the x-ray. It never was intended that this or any other diagnostic procedure should be a capstone or a final determination as to what to do. It is merely one of the things. A man who looks upon any one or the other of these various procedures in diagnosis, whether it be a van den Bergh or an icterus index or any other method of study that might be elected, including gall bladder visualization with the dye, as sufficient makes a mistake. It must be remembered that it is the sum total of what one finds, and not what the given individual procedure may apparently present; it is the sum total that the surgeon and the internist (if he is permitted to sit in on the question) should consider, and attempt to make up their minds as to what is best for the patient.

Originally the visualization of the gall bladder by means of the dye was meant to be a question of function alone, that is, whether the gall bladder could or could not fill. I think there is more to the study of the gall bladder by this means than just that alone. It is true that sometimes the gall bladder will not fill when the dye is given, orally particularly, at the first study, and that weeks or months later, that same gall bladder may fill and present a normal contour with practically normal emptying time. That does not mean, of course, that the procedure itself, is to be condemned, but it means that at the time the study was done, perhaps the gall bladder did not fill for one of various reasons. When the dye is given orally it not infrequently does not fill the gall bladder satisfactorily, but if the dye is given intra-venously and the gall bladder doesn't show, in my opinion it can be set down that that is a diseased gall bladder.

Just what the nature of the thing is perhaps may not be disclosed by the x-ray study, but it does often happen that stones which were not visualized by ordinary methods of study by the x-ray, can be visualized after dye is introduced. Ordinarily, we will say 75 per cent of stones might be visualized, perhaps not that high a per cent by the average x-ray technic, but there is an added group; that can be brought over to the side of visualization after dye is used.

Stones in the gall bladder are not removed

merely because they are stones and because they are there but because of conditions they cause. Many patients go on comfortably with gall stones, as every medical student knows.

It is a valuable means, and I personally should not like to do without it, and while I agree with what Dr. Frank has said, in that it is well enough to sound a note of caution that we must not just pin our faith blindly to the thing merely because it is a method of examination, or because sometimes it spectacularly discloses a diseased gall bladder; I want at the same time to urge the profession to not stand up so straight that it leans backward and to not lose faith in this very valuable method in the diagnosis of gall bladder disease.

**J. Hadley Caldwell**, Newport: I find myself more or less in accord with the previous speaker. While I am not posing as any great medical man, doing practically no medical work, I, like two of the others, want to sound a note of warning against this promiscuous cholecystectomy. I know that the leading surgeons of the country are almost routinely removing the gall bladder when they go into the upper abdomen. They consider it almost as a foreign body. In the large clinics the patient goes through a certain routine, the surgical case is brought to the operating table and operated upon in a most skillful manner. So far as the technic goes there couldn't be any criticism. Those patients generally make an uneventful recovery, leave the hospital, and are put down on the records as very successful procedures. Many times they go back home and are the patients about whom Dr. Simpson spoke, who are back to the medical man and worry him the rest of his life.

I always have contended that when you remove the gall bladder you do not remove all the disease. If you could take out a gall bladder as you can an appendix, as most people argue you should do, it would be different, but we all know that a diseased gall bladder in practically all cases is affecting the biliary ducts; we have a hepatitis, and generally a pancreatitis, and the removal of the gall bladder only removes a portion of the disease and later those patients have trouble, very often. The surgeon will argue that the man who goes in and drains the gall bladder has his patients come back. That is true, but he has something to work on, and that patient is more comfortable even though he has to drain the gall bladder again.

Unfortunately, one time I had to do an anastomosis of the common bile duct to the duodenum on account of one of these previous procedures, and I never want to do it again. It is too difficult and too dangerous. Fortunately the patient recovered and is living today.

I think as time goes on we will see that the pendulum will swing back and we will come more to the drainage of the gall bladder. I believe

in time there will be more anastomoses made of the gall bladder, probably, to the duodenum or stomach. Some one has been reporting some cases. I never have tried it myself, but it seems that it would be more nearly following out our physiological procedures. The removal of the gall bladder is a sort of fad that has been going on for several years, and the men who have been in medicine for the last twenty years or more know that we have certain fads. When I first started to practice medicine, the fad was to bone-plate everything, even simple fractures that were in perfect apposition. I call that meddling surgery. Every time you went to a medical meeting somebody had to get up and tell you about putting on a bone plate. A great many of them would have been better off without the bone plate. Of course, occasionally I put on a bone plate where it is necessary, and I, like Dr. Simpson, believe that it is all right to operate on the gall bladder when it is necessary, but we should not be too radical.

**M. Casper, Louisville:** These fellows have got my ire aroused a little, jumping on the surgeons so hard, so I shall have to talk for Dr. Abell and Dr. Thompson. When is a surgeon not a surgeon? Whenever he removes a normal gall bladder he is not a surgeon. That man does not belong to the class of surgeons who would remove a gall bladder or anything else that is normal; surgeons don't do that. I don't believe Dr. Simpson meant to leave that impression. For the same reason, a surgeon is not a surgeon if he has the abdomen open and finds a frankly diseased gall bladder there and does not remove it. That gall bladder should be removed in an cases, except in a few exceptions where the condition of the case does not permit it.

I think this is a valuable symposium, because we can lay our hand on that right upper quadrant of the abdomen which means so much; there are so many things that can be there.

One of the things that I don't like to see omitted is that other diseases often manifest themselves in this region that are pathology elsewhere. One of the saddest chapters in any surgeon's life is to have been guilty of opening the abdomen in a case of tabes, for gall bladder disease. I should like to keep that before everyone's mind.

There is a big advantage in making diagnosis in this upper right quadrant because of the fact that the history of the case, if carefully and painstakingly and repeatedly taken, tells so much. These laboratory tests are just as valuable, of course, but they are more confirmatory. If we will painstakingly let the patient tell us the history, if we will cross-examine and carefully take the history, we will get a clue to much of the diagnosis. The surgeon has brought out these facts. They take the history, operate on the case, and can check up; consequently, the

diagnosis has become very accurate in this particular kind of case.

Duodenal drainage is a valuable medical procedure. The administration of our old-fashioned remedy, Epsom salts, in the morning before breakfast over a long period of time is of great value in many of these biliary diseases.

Why do we take out gall bladders sometimes when we have no stones? There is a very important reason for that, because we have a vicious circle here, and by removing the gall bladder we break up the circle, and oftentimes when we have no stone, by taking out the gall bladder we have done a very valuable operation.

The Doctor mentioned in his paper something about benign growths of the duodenum. This is another mistake that surgeons are apt to make. They get in there, find a tumor, and think at once that it is malignant; most of the time it is not. Many of these cases are cured simply by gastroenterostomy if it is an inflammatory disease; a lot of them have been done, the surgeon thinking, "We will do a temporary or palliative operation," and the case went on and got well.

There is a medical treatment for duodenal ulcer undoubtedly, but we have also found that the medical man has very many times treated his patient over a long period of time, perhaps hospitalized him for six months and kept him on a starvation diet for years, and finally the surgeon has gotten in there and found he didn't have a duodenal ulcer in the beginning.

**Treatment of Tuberculosis with Methylated Antigen.**—Boquet and Negre describe how methylated antigen is prepared. In order to extract the bacillary lipoids, the killed and dried tubercle bacilli are treated with acetone. After forty hours of contact the acetone is removed by filtration and the retained bacilli are suspended in methyl alcohol, and this suspension is stored ten days at 37 C. After that time the suspension is filtered and the filtrate represents the methylated antigen. The extract prepared in this manner is diluted 1:20 in physiologic solution of sodium chloride and, in this form, presents a sensitive and specific antigen. The favorable action of the methylated antigen in experimental tuberculosis of animals led to its adoption in 1923 for the treatment of human tuberculosis. The authors give a detailed report of the technic of the treatment, and they stress that the injections should be given subcutaneously and in slowly increasing doses. Series focal and general reaction canthus be avoided. If the treatment is continued for a sufficient length of time, surgical tuberculosis can be cured and a favorable influence can be exerted on certain forms of pulmonary and renal tuberculosis.



## INJECTION TREATMENT OF HEMORRHOIDS\*

WILLIAM H. MASON, M. D.

Murray.

The treatment of internal hemorrhoids by the use of an irritating chemical substance injected into the pile, producing an edema and fibrosis and finally destroying the interstitial tissues and the fine network of veins and capillaries, which in time produces a shrinking of the tumor, has now become one of the scientific and ethical forms of treatment used by practically all proctologists and many general surgeons; and at this time not only the technique, but also the solutions used, have become fairly well standardized, and it is rapidly assuming its proper place in the field of Anal Surgery.

The origin of this method of treatment is somewhat obscure, but it was certainly first used in America and largely in the hands of Quacks who were styled "Pile Cures." According to M. R. Pruitt both Collier F. Martin and A. L. Sherman gave a man named Mitchell of Clinton, Illinois credit for the origination of the injection treatment. It was about 1871 that he began to inject hemorrhoids with a 33½% solution of Carbolic Acid. Mitchell kept this method a secret and sold it to individuals many of whom were non-medical men who traveled about the country advertising their treatment as a merchant would advertise his goods. The method received much criticism among the medical profession because of its secrecy and advocated by the Charatan and Quack. Because of the dread of an operation, sufferers were willing to undergo a simple injection, although given by an ignorant physician or non-medical man, rather than a surgical operation. Of course there were all kinds of results; some were good, but many were bad; so that by the beginning of this decade but few proctologists were using it at all. This method of treatment spread like wild-fire and in and around Chicago and other towns in Illinois there were thousands and thousands of cases treated in the hands of unskilled and unethical men. Hemorrhoids were not classified into types as they are today, as external and internal tumors, and both internal, external and all types were injected by these men. Of course it is no trouble to understand that there would be a great many failures, a great many complications and recurrences, and even in some cases fatalities. The medical men observed these various results and the treatment was taken up and criticized se-

verely by the medical press, and because of its being in the hands of Quacks and an advertised treatment, it was hard for the medical profession to see any good in it. It was true then, as it is today, that even a good treatment in the hands of a Quack or a Charlatan was repulsive to the scientific and ethical surgeon who knew at the same time what great results were obtained from the operation, both in the point of safety, surety of results and lack of recurrence. Well can I remember as a student of the late J. R. Pennington, as probably many others here do, that the very mention of the phrase "Injection of Hemorrhoids" was to him like shaking a red rag at a mad bull. Even as late as 1924 at a lecture at Atlanta, Georgia, given by Pennington, he made the statement that "The injection method (1) still belongs in the hands of Quacks." Yet two years later in an article published in the American Medical Association Journal, Volume 87, he tells of the advantages of the injection method, and also said, "I am fully in accord with Morley," who was recommending the injection treatment at that time in the highest of terms. If it took between two and three decades to convert a man like Pennington, is it any wonder that the treatment fell into disfavor and was revived only during the past ten years! Another reason for this method being dead for so long was the fact that the treatment of Hemorrhoids by operation using the clamp, cautery and ligature, and with the use of local anesthetic and other agents to lessen the pain, there were but few men who felt the need for a change or any other method.

### CLASSIFICATION OF HEMORRHOIDS

In order to carry out successfully the injection treatment it is very essential to have some knowledge of the anatomy of the part so as to be able to differentiate between Internal and External Hemorrhoids, since it is only in the Internal Hemorrhoids that the injection method has any field. Internal Hemorrhoids are situated in the upper anal canal above the sphincter muscle, in the very lowest part of the rectum and are supplied by the superior hemorrhoidal veins which finally empty into the inferior mesenteric vein and on into the portal circulation; while the external hemorrhoids are below the sphincter muscle and around the anal orifice composed of dilated veins from the inferior and middle hemorrhoidal veins emptying into the internal iliac veins of the systemic circulation. There is in this region usually communicating vessels between these two systems which may be responsible for the Interno-External Hemorrhoids, which we sometimes have.

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

### EXTERNAL HEMORRHOIDS

External Hemorrhoids are classified under four divisions: First, small varicosities around the anal orifice; Second, the hard blue thrombosed tumor formed by a blood clot caused usually from some mechanical irritation. Third, simple tags or tabs of connective tissue or simple skin which are a result of an old thrombosed external pile or the result of a bad operation either external or internal; Fourth, the infected hemorrhoid of any type. Only the thrombus and tag type require any surgical measures. Since that is the case, we will leave external hemorrhoids with the admonition never to inject any of these under any circumstances.

### INTERNAL HEMORRHOIDS

Internal Hemorrhoids, unlike the external are all of one variety, but for the description of the pile, in size, protrusion and discussion of treatment, they are divided into three degrees. In the first degree, there is simply a varicose condition of the small veins but these do not present any marked tumefaction, and remain inside of the anal canal above the sphincter muscle and in the lower part of the rectum. In the second degree, the veins are very much dilated and form distinct tumors. These tumors are forced down with defecation but return of themselves after defecation or straining ceases. The third degree are the very large tumors which protrude during straining or bowel movement and do not return unless pushed back by the aid of the hand. This is the type that is most usually complicated with prolapse of the mucous membrane and a very much weakened sphincter.

### SOLUTIONS

Of all the solutions that have been used, which include Carbolic Acid, Perchloride of Iron, Quinine and Urea Hydrochloride, Alcohol, Adrenalin, Acetate of lead, Ergot, etc., only two have stood the test of time; namely, Phenol and Quinine; Phenol 10 to 20% in equal parts of water and glycerine, and 5% in oil; and Quinine and Urea 5 to 10% with  $\frac{1}{2}$ % Novocain. Boaz of Germany, used Alcohol with good results, as did Edwards of England. But their technique was so painful and not being ambulatory was not used by many others. In England Phenol 10 to 20% in Glycerine and water is most commonly used. It is also used extensively in America.

By injection treatment we mean the injection into the interstitial tissues of some irritating chemical which will cause a proliferation of the fibrous stroma. Thus the veins are strangulated so as to reduce the mass and to hold the mucosa and submucosa in place. The term Hemorrhoids signifies

a pathological condition of the Hemorrhoidal veins in which there is a structural weakness producing a varicosity and dilatation of the net-work of veins and venules between the mucosa and deeper structures, and increased venous pressure from constipation, tumors of the pelvis, or some hepatic or other intra-abdominal condition, together with a bleeding mucosa. These vessels become tortuous, dilated and the elastic tissue is replaced by fibrous tissue.

### TECHNIQUE

There is but little preparation necessary except that the bowel must be empty. To inject first degree piles a speculum of some type is necessary. Otis' speculum is a good one; then also there is the Brinkeroff, Kelly and the Anoscope devised by Goldbacher. However, any speculum that will reveal the pile without causing too much distention and admitting a small 1 cc. Hypodermic Syringe is all that is necessary. For the injection of first degree piles I find that the tuberculin syringe is well adapted for that use. However, the ordinary run of Luer syringe with an extension, serves practically the same purpose. For the second degree pile that can be held down, and also the third degree ones that can be easily injected with any type of syringe since they are in full view and do not require the use of a speculum. If the second degree pile cannot be protruded and held out it must be injected through the speculum as in the case of the first degree.

With the Hemorrhoid well in view a small needle is inserted into the middle of the hemorrhoid, not too deep, but careful to get beneath the mucosa, enough of the solution is injected into the pile until it becomes very much distended and partly blanched. If upon entering the needle the solution produces a whitish color of the mucosa, that is an indication that the needle is not deep enough and if much of the solution is injected a necrosis will follow. The amount of injection used depends a great deal upon the solution. With a 10% solution of either phenol or quinine urea, probably 5, 10 to 20 minims would be the maximum. Whereas in using the weaker solution as in the 5% phenol in oil, you can use up to 1, 2, 3, or several cubic centimeters. I think it is almost impossible to use enough of this solution to produce a necrosis. If the tumor is large and only a small part is to be injected, it is best to begin at the upper portion of the tumor and inject downward each time. There is no special number of the piles that may be treated at one time, but probably one to three is sufficient for the first time, especially if the patient is nervous and very sensitive to treatment. These injections may be repeated in three or four days, until all are treated.



Then once a week until the hemorrhoids are obliterated, and the mucous membrane held in its proper position. Each hemorrhoid requires from one to three or four injections, depending upon the size of it, the character of the solution used and the amount. In a few days you will notice a great difference in the hemorrhoid; the color will change and the membrane will begin to look normal. If there is hemorrhage, it is best to select the pile that is bleeding and inject it first. In practically all cases, the hemorrhage will stop and the protrusion will disappear after the second day. If the injection of the hemorrhoid is properly done, there is no pain at all at the time of the injection or any time afterward. From three to six injections into each hemorrhoid about a week apart will be sufficient to cure any ordinary internal hemorrhoid. Gradual shrinking of the tumor begins in about 24 hours and continues until it has entirely disappeared.

While the injection method is simple in the hands of the skilled and experienced practitioner, it is very difficult and dangerous in the hands of the inexperienced. No one should undertake the operation from merely reading the description in the book, but should observe some man who has performed this operation many times before undertaking it himself. Otherwise, he will have some very serious results and bring discredit to the operation. I do not wish to convey the impression that the injection method is faultless, or should take the place of the surgical operation, but, it is a safe and satisfactory method and must be recognized as one of the standard forms of treating internal piles. The mulberry type of the internal hemorrhoids is the ideal one to treat with the injection method. Failures are indicative of incompetence and lack of skill in the operator.

Any internal hemorrhoid, not too badly swollen, strangulated or ulcerated, may be injected with excellent results and perfect safety. Those described above even may be injected after some treatment, but in most cases may better be treated by an operation. The fact that many men using different instruments and different technique have equally good results is evidence in itself that the success of injection treatments depends more upon the man using the instrument than the instruments themselves. Constant use of any instrument, however, renders it easier to handle. For the patient to be on the table on either the right or left side with the buttocks well out to the edge, seems to be the most ideal position. Yet each physician has his own choice of position, and since physicians are equally successful, it seems that the position plays but little part in the results of the operation.

#### CONTRA INDICATIONS

The injection method of treatment is suitable to the internal hemorrhoids only. It must not be used in (1) chronic fissures, (2) fistulas, (3) perianal infections, (4) rectal ulcers, (5) strangulated irreducible hemorrhoids with marked prolapsus of the mucous membrane of the rectum, (6) hypertrophy of the sphincter, (7) presence of any active inflammation, (8) external hemorrhoids of any kind, (9) or in any condition below the sphincter or covered by skin.

#### COMPLICATIONS

Many serious complications have been reported but most of them were those in the hand of beginners and many of them exaggerated. Necrosis is probably the most serious and most common. That can be prevented by being careful about the strength of the solution used, and the depth to which the needle is inserted. Necrosis indicates faulty diagnosis as to the type of pile or faulty technique, and should be avoided. Sepsis is nearly always brought about by operating on improper cases, those that are already infected with ulcers, fistulas, or fissures, or some form of inflammation around the anal region.

Recurrence: Recurrence takes place in anywhere from 10 to 20%. Most of these cases could be avoided by giving one or two more injections before dismissing the patient. It is true that after one or two injections the patient usually feels so good that it is impossible to get him to return. It is to be emphasized that although he may feel well, he must be assured that these hemorrhoids may in time return if they are not completely obliterated. Those that recur usually come back within from one to five years and one or two simple injections will relieve them promptly.

#### PATHOLOGY

The object of the injection and the pathology following the injection of an irritating chemical substance in to the venous net-work is to produce (1) an edema or swelling of the interstitial tissues followed by proliferation of fibrous tissue with a great many leucocytes and later a thrombosis of the veins and capillaries which in time strangle and destroy the interstitial tissues converting them into a fibrous net-work connecting the mucous and submucous to the muscularis beneath.

#### ADVANTAGES OF THE INJECTION METHOD

Some of the advantages of the injection method over the operation are as follows: There is no pain, no hypodermie, no anesthetic, no nausea and vomiting, no stricture, no weakness of the sphincter muscle, no going

to bed, no loss of time, no hospital bill, no loss of meals, no foul odors or dressings to be applied, ability to carry on the regular every-day activities, few recurrences, bowels move daily, relief is immediate and there is steady improvement. All of these combined are a great weight on the side of the injection method in preference to a surgical operation in selected cases of internal hemorrhoids.

I do not know that I can say anything that would be of more interest than to quote the opinions and experiences of some of the men who have done so much of this work, in order that the subject may be heard from all angles.

J. P. Lockhart-Mummery makes the following statements in the Practitioner: "The injection treatment is a very suitable treatment in the following cases: (1) in old people; (2) in patients with some other disease which contra-indicates operation; (3) in pregnant women; (4) in very busy people who are quite unable to spare the necessary time to undergo an operation and who wish to be relieved for the time being with the minimum of inconvenience.

Results of the injection treatment for piles are often most satisfactory, but careful selection of cases is necessary and the patient should be warned that a recurrence necessitating further treatment will probably occur."

E. Parker Hayden, (3) in giving his version of the subject says: "The treatment of internal hemorrhoids by injection is a simple, safe, and satisfactory method when intelligently applied and carefully carried out. It requires no hospitalization, causes little or no discomfort to the patient, and may properly replace surgical removal in the majority of cases."

From an article by M. C. Pruitt (4) in the Journal of the Medical Association of Georgia we learn the following: "It is absolutely essential to have sufficient knowledge of the anatomy of the part and to make a physical examination with such a degree of care that you will be able to differentiate between external and internal hemorrhoids, as only the internal type without complications is suitable for this method.

The injection method is not without fault, but must be recognized as one of the standard forms of treating internal hemorrhoids."

Frederick B. Campbell, (5) makes the following statements in an article on the Injection Treatment for Hemorrhoids in the Journal of Missouri State Medical Association: "While serious complications from this form of treatment have been reported, its dangers are exaggerated. When we consider the great number of such treatments given,

a large per cent by incompetents, the accidents are surprising few. Even so, it should not be undertaken lightly, as accidents may occur here as in other procedures where asepsis and good judgment are prerequisites of success.

A slough denotes faulty technic. Most of the accidents in my cases occurred early in my experience and were due to superficial injection or leakage about the puncture wound. These healed rapidly, without any infection and without discomfort to the patient.

When the solution is deposited in a large hemorrhoidal mass there is little or no pain, but in small hemorrhoids or in the submucosa, as in the case of the prolapsed mucosa, aching pain is produced by the local tension upon the muscularis resulting from exudate of fibrin about the foreign substance. This aching usually begins in less than half an hour and lasts less than an hour after injection; but it may vary considerably.

The injection treatment, is an ethical practical procedure, deserving a better and wider understanding among the members of the profession. Surgery continues to be the ideal treatment in the majority of cases."

William W. Rixey, (6) in an article in the Virginia Medical Monthly has this to say: "The injection causes little or no pain, is more economical than operation, and is strictly an ambulatory treatment. With a careful technique and attention to details, a proper placing of the injection and the use of a correct quantity of the solution, complications will not occur.

The injection treatment encroaches upon the field of hemorrhoidal surgery, for the average patient will not accept operation and hospitalization when they can be safely avoided. On the other hand, a modern hemorrhoidectomy under local anesthesia, with careful post-operative attention, can no longer be classed with the painful experience of a few years ago."

J. W. Warren, (7) in reporting on 1,000 cases of Hemorrhoids treated by office methods in the New Orleans Medical and Surgical Journal states the following: "If the injection of hemorrhoids is correctly done there is no pain at the time of the injection nor afterward.

In hemorrhagic cases 90 per cent cease losing blood after the first treatment and cease protrusion after the second or third. From three to six repetitions of each hemorrhoid, a week or so apart, results in normalizing the excess blood supply and tightening up the relaxed mucosa. Gradual atrophy of the tumors begins in twenty-four hours and continues, with added treatments, to final disappearance.



I find that returns are slight, only two or three treatments being again needed. All patients are instructed to return promptly, if and when the need is felt.

Advantages of the office method: There is no operation, no bed, no hospital, practically no suffering, no hospital bills, no nurse bills. Five minutes in the office once or twice a week, patient continues to earn his salary, to hold his job or to keep up his business."

Pennington says that the advantages of the injection method are that it can be made use of when the patient refuses more radical methods, and since no general anesthetic is administered, there is no post-anesthetic disturbance, such as vomiting; there is no pain; the patient is not confined to the bed, so he loses only a few hours from work or business; and relief is immediate, and there is steady improvement. He further states that in the past injections were looked down on because of the advertising proclivities of their sponsors, but for years past they have been habitually resorted to, especially abroad. They command respect if for nothing else than the sheer weight of numbers.

Martin states that more than 4,200 patients were treated by his father and himself. Murphy of England, used phenol injections several thousand times with good results. Fansler in about 1,200 injections of quinine and urea hydrochloride had a few instances of superficial sloughing, three of these with secondary hemorrhage, but the end results were uniformly good. Morley, in nearly 4,000 injections, had but one case of thrombosis.

Pennington also says: "I am thoroughly in accord with Morley, who in the course of his article recommending the injection method writes: 'I know very well that when medical men suffer from hemorrhoids they prefer injection to operation—if they have ever heard of the former—and I have had no more grateful patients than the many doctors I have treated. They admit when it comes to their own turn, they cannot afford to lie up, and that their experience of operation on their patients make them dread the first few days after the operation on their own piles. And who, I would ask, from a cabinet minister downward can afford to lie up in these times, if there is any way of avoiding it.'"

Edwards, an English proctologist states: "As an advocate for this method, I cannot put it stronger than by saying that if I were the subject of uncomplicated, reducible, internal hemorrhoids, which called for operative interference, I would select injection in preference to any of the recognized operations, always provided that it could be carried out by one who had had at least some experience of its simple technic."

## SUMMARY

(1) I think the injection method is a scientific, ethical treatment of internal hemorrhoids; it is simple, safe and satisfactory; it is ambulatory, free from pain, and is followed by few complications and about 15% of recurrences. (2) Of the many solutions used, only two, namely, Quinine and Urea Hydrochloride 5 to 10%, Carbolic Acid 10 to 20% in glycerin and water, and also carbolic acid 5% in oil, has stood the test of experience. (3) It is not a method to be used by the amateur or without having a fair knowledge of the anatomy, and then only after having observed a number of cases managed by skilled and experienced operators. It requires equally as much if not more skill to use the injection than the operative method. (4) It is not to take the place of the operation in all cases of even internal hemorrhoids. This form of treatment is now being done by all proctologists and most all general surgeons and is rapidly becoming the choice of procedure even in the hands of those who once criticized it most. The fact that thousands of cases have been successfully treated by the best proctologists and some with less experience with no ill results and that all doctors who know of the method want it used on them when they come to be the patient, is the greatest argument in its favor. It is not suitable in external hemorrhoids of any type, neither in internal hemorrhoids in the presence of acute or chronic inflammation or other associated pathology; neither can it be used in the type known as the interno-external hemorrhoids. Great care must be used in inserting the needle with a strong solution that must be injected deep into the connective tissue and not under the mucosa. While the weaker solution may be injected into the submucosa and generally gives the best results when used that way.

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## DISCUSSION

**A. H. Barkley**, Lexington: Of course, in certain forms of hemorrhoids there is no question but that the injection treatment is an ideal treatment if everything goes right. I never have used the injection treatment, but I have seen it used by men who are much more skillful than I am.

I remember three occasions on which Dr. Tuttle who was recognized as an authority on the rectum in those days, injected hemorrhoid. He had a sudden death in all three of them. I think they were the pedunculated type. In cases where there is infection it probably would be a very hazardous thing to inject.

**William H. Mason**, (in closing): I have in my paper quotations from some of the men, without any bad results. Martin says he and his father treated over 4,000 without a single fatality. A number of men have done from one to three or four thousand without reporting a single fatality. I don't understand why the cases should have been fatal of which the Doctor has spoken. Of course, it may have been like a great many other things; sometimes we have coincidences for which we can find no reason.

One time I took a fellow into the office to make an examination, and he had a stroke of paralysis as he got on the table; nothing had been done to him. Sometimes people die suddenly without anything that we know of having been the cause.

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**Liver Extract, Liver Ash and Iron in Treatment of Anemia.**—Keefer et al. report the results of a study of the effect of feeding liver extract, liver ash, and iron to patients with various forms of anemia. The following facts were evident: Liver extract was of demonstrable value in increasing the regeneration of hemoglobin in some of the obscure nutritional anemias of childhood, in some of the anemias associated with dysentery in hookworm infestation and in pregnancy. In some cases its effect could be enhanced by iron. Liver ash, when given in amounts that were equivalent to 300 Gm. of whole liver, was of little demonstrable value in increasing hemoglobin regeneration. In some cases there was a slight increase in the reticulocytes, hemoglobin and erythrocytes, but the results were never as conspicuous as those obtained with liver extract or large doses of iron. Iron was effective in the treatment of various forms of anemia. Large doses were more effective than small ones. In many instances the effect of iron exceeded liver, liver extract or liver ash, and in some cases a favorable response did not occur until iron was added. When recovery from the anemias followed either liver extract or iron, there was an increase in the reticulocytes of the circulating blood.

## A STUDY OF SOME PHASES OF DYPNEA: A CASE REPORT\*

J. D. WILLIAMS, M. D.

Ashland.

Serious obstruction to breathing is a condition any physician of reasonably full experience must have seen, perhaps many times, particularly so in early childhood. It is an awesome spectacle, calculated to harrow the soul of the observer when he comes to the realization of a definitely impending fatality he is unable to avert.

It was a tragedy of my early days, judgment immature and experience lacking, and being far from help, that I suffered the sight of a little boy dying from lack of air whose life, even at that late hour, might otherwise have been saved. The memory remains and inspires this paper whose burden is to urge that when certain hereinafter named symptoms present themselves action must be both bold and hurried, an argument of inadequacy of instruments or surroundings being a flimsy excuse for a plain dereliction of duty.

Inasmuch as the case to be reported is that of a more than middle-aged individual this paper will deal essentially with those beyond adolescence.

Respiratory interferences must necessarily have their principal seat of action in the larynx whatever the cause may be and wherever located and more immediately the involvement must be glottic or of the vocal bands. The larynx, through the marvelous efficiency of its muscles, acts in a double capacity, that of phonation and of respiration. Of these the abductors are in more or less continuous activity so that in quiet respiration the chords are stationarily wide apart and the physician may, with the mirror alone, in the majority of cases, study the trachea to the bifurcation and even beyond. Per contra these bands are in juxtaposition in all forms of phonation.

Mainly the nerves involved are the superior and inferior (or recurrent) laryngeal branches of the vagus. Since these efferent or motor fibers to the respiratory phonatory muscles must have their origin in the gray matter beneath the fourth ventricle the significance of cerebral disturbance in the diagnosis, evident in my case in all the attacks, is inescapable.

The consensus of opinion is that stimulation of the inferior laryngeal nerve causes contraction of the adductors muscles and advancement of the vocal bands to the middle line. The converse of this would be stimulation of the sympathetic and the broncho-

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\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.



dilator branch of the vagus with contraction of the abductor muscles and a coincident outward movement of these bands, the normal condition with voice at rest. Transverse section of these nerves causes paralysis of both groups of muscles and the vocal bands at once assume the cadaveric position. Again, if there were sufficient continued stimulation of the inferior laryngeal nerve, both bands might be in a static condition centerward with consequent temporary suspension of respiration or fatal asphyxia. Fortunately the paralysis is generally unilateral, permitting of some inhalation.

Again certain cerebral pathologies of systemic origin might eventually produce a hypertonicity of one or both chords.

In respect to remote stimuli it is of interest that the mucous membranes of the larynx, trachea, stomach and intestines are associated with the phonatory center and this explains how stimulation of any of these may be followed by adduction of both bands and their supporting arytenoid cartilages.

Hence, the stridulous laryngitis familiar to you all, the resultant of such gastric irritation, and spasms of the throat from the entrance of foreign bodies, of the lungs from nasal hypersensitiveness, are obvious and certainly terrifying evidences of irritation of the laryngo-constricting pneumogastric branches, whose relationships are so widely distributed in thorax and gastric regions. Your attention will be attracted to the symptomatic tickling cough that immediately preceded the attacks in this patient.

An unilateral chord abductor involvement of paretic type may be consequent on peritracheal gland enlargement, aneurism, foreign body in the oesophagus or trachea, apical fibrosis, abscess from gland infection, aoritis, thyroid-isthmus engorgement, cardiac enlargement, perivascular thickening, or any gross pathology causing pressure on the vagus or any of its laryngeal branches.

Then the chord may assume the cadaveric position mentioned but generally remains in the middle line, phonation not being materially interfered with because it is in the proper position for voice production and permitting the entrance of air. In addition to the above the physician will have in mind an emotional state, such as hysteria, and laryngeal vertigo, in which last there is severe irritation of the larynx with coughing and glottic spasm, congestion of the head, and asphyxia, with convulsions of the face and extremities. The patient falls unconscious, but it is notable that in this condition the recovery usually is rapid and complete. Likewise epilepsy, tabes, tetanus, rabies, emphysema and gout are among other occasional psychic manifestations.

As to that related and important symptom, hoarseness, I saw a lady two weeks ago, who had been treated over a long period for laryngitis during which there had been several attacks of breath shortness, referred to the chest. Upon laryngoscopic examination I found a very small strawberry like tumor whose pedicle was attached to the under surface of the right chord and whose excursions varied with laryngeal use, it falling under the chest. Upon laryngoscopic examination I forced above the nearly apposed chords in phonation.

L. T., male, age forty-two, married, there had been no children, no pregnancies, consulted me on August 14th. He looked and seemed so ill that no more history was then gotten than that he had several times actually been in extremis from choking, the throat examination being at once proceeded with. The local condition was immediately apparent as a partial paralysis of the right vocal chord, it but slightly participating in the abduction of ordinary respiration. The nasal tones aroused suspicion as to a possible tumor or gumma, and in addition to an increased dependency of the soft palate, there was erosion of the nasal septum. Deep eye examinations disclosed an involvement of the retino-choroid coats of both eyes and some vitreous opacities. There was the characteristic difference in the pupil widths, there was no response to light but certainly to accommodation and convergence, this likewise suggesting lues of a progressive paralytic or tabetic type. It was notable that arterial pulsation was visibly accentuated in the eye; a distinctly pathological state, pointing to internal pressure.

This retino-choroidal and iritic pathology is in the greater proportion of cases either syphilitic or tuberculous and as to the latter, it may be emphasized that the ophthalmologist will frequently make a diagnosis before the patient or even the physician, perhaps, has an inkling of the disease in any part of the body. I was practically certain then of a diagnosis of syphilis and having in mind the winding about the aorta of the inferior laryngeal nerve that there most certainly was a retro-sternal involvement of some sort.

Then the personal history, that of the family being negative, which was interesting in the incidence of a tertiary manifestation seventeen years after a presumed cure. A very capable surgeon had advised tonsillectomy and attention to teeth. The advice had been acted upon without benefit, before I saw him, also he had been told by a throat man that he had spasm of the glottis. Again he had been treated for nervous stomach, rheumatism and many other conditions.

The story of the happenings in the attacks

was dramatic. There was in regular sequence first a peculiar taste, then a tickling cough, then a simulation of angina pectoris, followed almost instantly by convulsive inspiratory stridor, dyspnoea, unconsciousness, complete cessation of pulse and to all appearances, death. The recovery, as distinguished from that of laryngeal vertigo, was very slow and necessitated most heroic treatment, in one instance an injection of adrenalin into the pericardial sac and in all attacks, artificial respiration.

Question: Did the adrenalin have the effect of relaxing the spasm through the sympathetic system as well as stimulating the cardiac action? And what of the element of hysteria, if there was such, and succeeding fright, in the etiology?

In the hurried inspection at the office, it was feared that a tracheotomy might be necessary and he was sent first to the roentgenologist and then to the hospital for a thorough examination and observation where it was positively determined that the condition was thoracic. The confirmation of the diagnosis by the x-ray in demonstrating a typical aortitis removed any doubt as to its nature.

The pathognomonic symptoms of laryngeal and cervico-tracheal involvement, obvious retraction at the supra sternal notch and in the epigastrium, presenting a picture so impressive as not to be easily forgotten, were absent as was the characteristic breath sounds heard when the observer's ear is held near the patient's open mouth. The symptoms are positively diagnostic of a condition of such grave importance that the physician must needs be always on the alert in any case of marked dyspnoea since their presence makes imperative an immediate tracheotomy. There can be no hesitancy here.

Since the source was not laryngeal no surgery was indicated and under the influence of intensive administration of mercury and the iodides, intravenously, with bismuth intramuscularly, and except for a few mild attacks, the man recovered.

#### DISCUSSION

**S. C. Smith, Ashland:** Osler said several years ago that if you know syphilis in all of its manifestations you know medicine. A case report like this made by Dr. Williams emphasizes the importance of knowing syphilis. There are so many symptoms that arise from it that simulate other conditions that in knowing syphilis you know many other things besides.

The necessity for doing immediate tracheotomy and the fact that inadequate instruments or location were no excuse, was well emphasized by Dr. Williams.

We recall seeing in the press only a year or so ago that some doctor was called to see a

child that had a foreign body in the upper part of the larynx, and he used his pocket knife to do a tracheotomy, and used some available apparatus for holding the tracheotomy wound open so the child could breathe until a tracheotomy tube could be obtained. The operation is not dangerous; it is much more simple than one would think who had never seen it done, and it is one that can be repaired easily after the condition is removed, and the patient goes on quite as well as ever before.

In regard to pressure on the various branches of the pneumogastric nerve causing these spells, there are some features about that that have always been difficult for me to understand. One is why pressure below the larynx, a considerable distance below, will often cause an involvement apparently in the region of the larynx and cause this dyspnea which Dr. Williams described. For instance, in a case of aortitis not of syphilitic origin, it is not at all uncommon to see cases of rather embarrassing dyspnea in these patients with a general aortitis. This case that the Doctor reported I am satisfied was a case of local aortitis with aneurysm formation. I did not see the x-ray film, although he told me about the case some time soon after it happened.

In dealing with a case of dyspnea, the thing that we should do is to catalog all the causes rapidly in the mind, which might be responsible and then, through a process of elimination, try to arrive at our diagnosis.

The paper was excellently presented, and for a specialist I thought it was of unusual interest to the general practitioner because it deals with a subject that all of us may have to deal with at any time.

**B. S. Rutherford, Bowling Green:** The essayist mentioned a case similar to one I had forty-six years ago. It was the first year I practiced medicine, a case of dyspnea purely from an aortic aneurysm pressing on the recurrent laryngeal nerve. I was twenty-two years old at the time, and I hadn't learned how to diagnose those cases then. Dr. McCormack's father came out and diagnosed the case for me. I watched it throughout its course of several months duration. The man would have a paroxysm of difficult breathing in which the suffering was excruciating. He would breathe fairly well at times and then he would have a severe paroxysm.

There occurred, I think between the third and second ribs, a protuberance which got larger and larger and extended farther and farther out. There was an old doctor who was called in consultation after Dr. McCormack had diagnosed it thoracic aneurysm, and he said it was an abscess, and advised me to lance it, but I never could summon the courage to after Dr. McCormack said it was an aneurysm. The man was a brother of Senator Skyles, Senator Skyles was there the night he died. He said, "Doctor,



do you really think that was an abscess? If it were an abscess and you opened it, would it relieve him?"

I said I thought it would.

"Well, he is dying. Can't you experiment a little?"

I said, "Not with a knife. I will introduce a hypodermic needle and see what is in there, if you say so." I introduced a hypodermic needle and blood came.

There is another case of dyspnea that occurs to my mind that I am an expert in curing. I cure every case I see, and do it promptly. I was called to see another doctor's patient a few days ago. The patient was resting on her head and heels, holding her breath until she would get black in the face, and then she would scream. Everybody thought she was dying, it was purely a case of hysterics.

The husband said, "Doctor, can you do anything for her?"

I said, "I think I can." I prepared a tenth of a grain of apomorphine, and gave it hypodermically, in about three minutes I saw her yawn and begin to vomit, she breathed very naturally and quietly after that.

She saw her own doctor the next day, and she said, "That man ought not to be allowed to practice medicine. He made a mistake and gave me the wrong medicine which came very near killing me."

**J. D. Williams**, (in closing): To Dr. Smith's suggestion of a pocket knife I might add that a pair of bent hairpins will serve the purpose temporarily in getting the patient breathing, in case of great emergency. Instant action not being demanded careful preparation should be made for an operation requiring for its proper performance a high degree of surgical skill since the incision must be exactly in the median line of the trachea, must not be too high else the thyroid isthmus will be divided, low enough but not too low else the opening be retracted behind the sternum, no blood allowed to enter the trachea etc.

I recall an interesting case, not exactly in connection with the report I made, of a boy who inhaled a cocklebur. A laryngologist in a neighboring city, did a tracheotomy, failed to find anything, and thirteen months later the boy had pleural empyema. The pus was evacuated and the boy coughed up the burr.

I would call attention in the matter of difficult breathing to the suggestion of Chevalier Jackson that in every case of this nature an x-ray should be had. He quotes numerous instances in which mistakes were made in the diagnosis where foreign bodies were in the lungs or trachea and were found by the x-ray, the patient having been treated for other conditions.

**Question:** What about the thymus?

**Dr. Williams:** I think that has been a little overdone. A good many deaths have occurred

on the table under general anesthesia possibly from enlargement of the thymus. I know that in every case where I suspect thymus enlargement I have a radiogram made, and if it shows apparent enlargement the x-ray is used, and usually two treatments are quite sufficient to reduce the thymus.

## SO-CALLED MODERN URINARY ANTI-SEPTICS\*

CLAUDE G. HOFFMAN, M. D., F. A. C. S.

Louisville.

Some years ago an enterprising gentleman advertised in the midwestern farm papers a "sure way to kill potato bugs without sprays chemicals or expensive equipment. Full directions sent on receipt of one dollar." Farmers who sent in the dollar were advised to "first catch the potato bug, then place him on a shingle, and hit him sharply with another shingle." Presumably, this gentleman's activities were curtailed by the postal authorities but I have sometimes wondered, in the last few years, if he had not perhaps entered the pharmaceutical business and gone to manufacturing and advertising urinary antiseptics.

The ideal urinary antiseptic would be a drug which, when taken by mouth in adequate dosage, would produce no gastro-intestinal or other disturbances; which was incapable, when properly used, of damaging the kidneys; which would produce in the urine, from the pelvis of the kidney on down through the entire tract, a concentration of antiseptic substance sufficient to be destructive to the pathogenic organisms which cause urinary infections; and at the same time absolutely non-irritating and incapable of damaging even the inflamed lining of the diseased tract. To fulfill the ideal requirement this drug should be completely active in itself; that is, it should require the administration of no other drug to reinforce its action through altering the reaction or otherwise changing the urinary secretion. Unfortunately, such a drug does not, as far as I am aware, exist and this paper is designed to enumerate the indications for the use of existing urinary antiseptics but also, and perhaps even more important, to emphasize the limitations of these drugs in practical urological applications.

I think we may safely assume to start with that no urinary antiseptic is of any real value in the treatment of acute urethritis of gonorrheal origin. Tons of Hexamine, and in an earlier day, Methylene Blue have been prescribed for and taken by patients of this

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

type presumably without any other than the psychic effect.

In the common infections of the upper urinary tract and bladder, there are two urinary antiseptics which, within my personal experience, have a definite field of usefulness and for the employment of which I shall attempt to outline adequate indications. These are Hexamine, or as it is still known to many under the trade name by which it was originally introduced, Urotropin; and Phenylazo-alpha-diamino-pyridine-monohydrochlorite, a much more recently introduced antiseptic dye substance which is sold under a variety of trade names as Pyridium, Serenium and Malophene. Methylene Blue, one of the earliest urinary antiseptics, I believe to be distinctly inefficient and I find no occasion to use it. Caprokol has enjoyed a considerable popularity and is still largely used. For my own purposes, I do not find it superior to drugs of the pyridium type.

It does not, however, suffice simply to prescribe any of these drugs, with the presence of infection as the indication, without due regard to the factors which may influence their action. These factors are: The bacterial type and anatomical situation of the infection; the reaction and concentration of the urine; the rapidity and continuity with which the urinary tract is being drained; the condition of the patient's gastro-intestinal tract and the degree and character of the discomfort he is suffering.

Streptococci, staphylococci and many other less common organisms tend to decompose urine, rendering it highly alkaline. In the presence of these organisms it may be difficult or impossible to produce and maintain an acid urine. As, is well known, Hexamine is entirely inefficient in an alkaline urine, since, except in an acid medium, the breaking down of the drug with the production of formaldehyde, upon which it depends for its activity, does not occur. With colon bacillus infections, on the other hand, it is relatively easy to acidify the urine by the use of acid sodium phosphate, sodium benzoate, or ammonium chloride and keep it so.

Urinary concentration, and hence concentration of the drug in the urine, is an important factor often overlooked. It is necessary not only that the antiseptic agent be present but that it be present in sufficient strength to exert its action within the time available, which again will depend on the rapidity and continuity of drainage of the urinary tract. Except in the presence of quite complete obstruction, Hexamine is inefficient in the kidney pelvis since the time required for conversion of the drug into formaldehyde, and the constant dilution of this active agent when formed, prevent an ef-

fective concentration from being maintained in the pelvis continuously enough to exert antiseptic action. The same condition obtains in the bladder when it is being drained continuously.

A marked tendency to nausea, often present as a result of the urological condition, imposes a necessity for caution in the co-administration, with Hexamine, of an acidifying agent. Ammonium chloride, which is most effective, is also most apt to disturb the gastro-intestinal tract. Acid sodium phosphate and sodium benzoate are less apt to do so, but require to be watered in this connection. Oftentimes the reaction of the urine can be partly or wholly controlled by diet; an excess of bread, meats and cereals tend to create an acid urine, while emphasis on potatoes, fruits and vegetables produce an alkaline reaction.

A larger consideration of the comfort of the patient may lead us at times to refrain from forcibly acidifying an alkaline urine and suggest making the urine even more alkaline, and dilute, when purely local considerations would seem to indicate the opposite course. Occasionally the production of an acid concentrated urine in the presence of urinary infection makes the patient so uncomfortable that it seems necessary to let urinary antiseptics go by the board entirely and approach the problem by other means.

It is then evident that exact figures as to the bactericidal efficiency of different antiseptic drugs in various dilutions are chiefly of academic interest since conditions in the test tube and in the constantly changing environment of the urinary tract will not bear detailed comparison. There are hundreds of drugs which may be depended upon to destroy the urinary pathogenic bacteria *in vitro*: There are none which may be depended upon, except under rather ideal circumstances, to do so *in vivo*.

If then, there is any tendency in the mind of the physician to choose between the administration of urinary antiseptics, and instrumental methods in the treatment of an urinary infection, the use of these drugs had far better be omitted entirely, since under these circumstances they serve only to prevent the patient from securing adequate treatment or to lull him and his physician into a false sense of security in the belief that something effective is being done.

It is true of almost all urinary infections that, if the infective factor could be miraculously cleared up overnight without otherwise altering the anatomy or pathology of the urinary tract, the infection would be well on the way toward returning in full force within forty-eight hours, so that merely destroying such organisms as exist in the tract



is of doubtful and temporary value. The reason for this is that there is practically always an obstructive factor which, in the first place, prepared the ground for infection and which subsequently keeps the mucous membrane in such condition as to be ideal soil for infection. The infection itself is never wanting and opportunities for reimplantation of pathogenic organisms do not have to be created but are ever present. They may perhaps arise from the gastro-intestinal tract, as is the case with the very common colon bacillus infections, or from foci of infection elsewhere in the body, at any rate, the destruction of the organisms existing in the urinary tract produces no important or fundamental change in the condition which has brought about the infection.

By way of illustration of this fact one need only recall that lavage of the renal pelvis is apt to be approximately equally effective whether performed with potent antiseptic solutions or with plain, sterile water. The reason lies in the fact that minor degrees of obstruction are relieved by the instrumentation, that adequate drainage is instituted and maintained and that these objectives having been gained, the infection tends to take care of itself. It is, therefore, strongly my feeling that urinary antiseptics should be used only in connection with an adequate and well considered plan of expert, urological treatment including whatever instrumentation and local applications may be necessary or advisable; that under these circumstances they should be used with due care to obtain their full activity.

Each case of urinary infection is evidently a separate and distinct problem in itself. Most cases, however, offer in a general way three other indications beside the indication for rendering the urine antiseptic if possible. These are: First, re-establishment of free urinary drainage; second, extirpation of the focus of disease, if possible; and third, such general measures as may be needed to aid nature in restoring a normal state of affairs.

The foregoing discussion of the limitation of urinary antiseptics will make it evident that little reliance can be placed upon them unless the focus of infection has first been sought, found and dealt with and unless free urinary drainage has been established and maintained. "Thus, the Urologist is required to think in broader terms than his specialty, and the General Practitioner is again warned not to rely entirely for improvement of any urinary infection on the administration of 'this or that' much heralded antiseptic."

In conclusion I wish to quote from the Year Book of Dermatology and Urology of 1931, the following: At the Congress of the

International Urologic Society (Madrid, April 7-12, 1930): A. P. Martin the referee observed modern medical science has made very praiseworthy efforts to obtain an efficacious urinary antiseptic, though while crowned with success in some cases, the results have not been uniform, and we may assert that the life of the most popular substances of today will be short. Some are only a memory, and others not even that.

#### DISCUSSION

**Jethra Hancock, Louisville:** Dr. Hoffman's paper, to my mind, is very timely. It brings before us a subject that is often misunderstood by the general practitioner. His presentation is almost a classic because of its simplicity and directness.

We are often asked the question: What can we use as a urinary antiseptic for urethritis of gonorrheal origin? This question is usually asked with the inference that there is some treatment for gonorrhea that can be successfully administered orally; that various pharmaceutical agencies seem to encourage this belief by recommending some so-called urinary antiseptic as a remedial agent for gonorrhea. This is foolish. As in any other urological condition, as Dr. Hoffman has told us, it is important and practical to use agents to keep the urine in physiological equilibrium with other secretions of the body. As in all other similar conditions proper elimination is of primary importance. This is true of urethritis as it is true of lesions of the kidneys. We know that proper elimination is highly necessary and must be had if we hope to secure success in the treatment of these maladies.

I feel very grateful personally to Dr. Hoffman for this paper because it becomes my duty, officially, very often to discuss with doctors the effectiveness of urinary antiseptic as a treatment for gonorrheal urethritis.

No one with any considerable experience would for a moment consider oral medication for the treatment of urethritis of gonorrheal origin. When the uro-genital tract becomes infected with gonococci it becomes a surgical condition and the success or failure of handling same depends very much on thorough drainage, finding the many foci of infection by whatever means in the hands of the urological surgeon that drainage may be effected. Certainly in the acute inflammatory conditions this is impracticable and rest with Sitz baths is probably the treatment of choice.

I would not like to be left in the attitude of saying that there is no virtue at all in the administration of so-called urinary antiseptics in the treatment of acute gonorrhea, yet the value is so negligible that oral administration is hardly to be considered as an effective treatment.

As above indicated, we must have drainage if we are to kill the bacteria. We must reach the

seat of infection with the remedial agents directly if we are to hope for prompt relief of the infection.

**Claude G. Hoffman**, (In closing): The object of reading this paper was to bring out one point, the indiscriminate use of urinary antiseptics. The average physician of today, when a patient comes to him with pus in his urine, will prescribe some urinary antiseptic, most frequently urotropine or something that some detail man has just left him, without ever inquiring into whether the urine is acid or alkaline. I bet I see twenty patients a week who are taking urotropine on their own advice or their physician's without knowing whether the urine is acid or not, and we all know urotropine is worthless when not given in an acid urine. At the same time they are told to drink lots of water. When you are making an antiseptic solution, the more dilute it is, the less efficacious. The urine has to be absolutely concentrated with the drug to do any good at all. We all probably have given a patient a urinary antiseptic and told him to drink lots of water. It is the water that has the effect. When you are giving lots of water you cannot give urinary antiseptics effectively, so to take the lesser of the two evils, I think the water and the flushing gives better results.

#### SYMPOSIUM ON LATENT SYPHILIS THE PATHOLOGY OF LATENT

##### SYPHILIS\*

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If we understand by the term "latent syphilis" the condition in which there are no symptoms at all, or only vague symptoms of disease, but with the pathology of syphilis, that is the presence of the *treponema pallidum* in the tissues with the characteristic inflammatory reaction, then it certainly follows that all lesions of syphilis may be latent. The primary chancre, the secondary lesions, the tertiary gummata, and the quartian central nervous system lesions may be present, but symptomless.

However, this title usually includes only lesions of the tertian and quartian state and for that reason these remarks will be confined to them.

There is a fundamental great similarity in all syphilitic lesions. The typical syphilitic lesion consists of a gumma, whether large or small, multiple or single, fibrotic or not. And essentially a gumma consists of a central area of necrosis surrounded by chronically inflamed granulation tissue which is infiltrated by lymphocytes, plasma cells, endothelial cells and an occasional foreign body giant cell.

The proportion of different types of cells present varies greatly in different lesions, but generally in the early or young lesions polymorphonuclear leucocytes, predominate and in the oldest lesions the predominating cell is the lymphocyte. Using this typical lesion, the gumma, as a text, the pathology of all syphilitic lesions may be accurately and correctly described, the different ones varying only in minor details.

There is one other point which I wish to stress and that is this, that the *treponema pallidum* has a selective affinity for certain tissues of the body and these tissues are first, connective tissue, and second, epithelial tissue. These structures receive the brunt of the attack of the *treponema pallidum*. The viscera in which such lesions as are usually classified as latent, are found in the following visera, named in the order of the frequency of which the infection occurs in them:

**TESTIS:** In the testis the lesion begins in the stroma. It consists of multiple foci of tissue destruction including both stroma and parenchyma, followed by marked connective tissue repair. As a result of this new connective tissue and disturbances of the circulation, secondary to blood vessel damage, more parenchyma of the testis gradually atrophies and is also destroyed. Lymphocytes are abundant. The end result is a badly scarred testis with most of its parenchyma gone, the little remaining is atrophic and useless. The lesions may be small or large, in the former case the condition is sometimes described as diffuse infection. If the involvement of the testis is extensive it can contribute nothing to the semen and the internal secretion is very much lacking or completely absent.

**AORTA:** For some unknown reason the upper part of the aorta, beginning with the first portion of the arch, is most frequently attacked and the instance of affection decreases as we mention each portion of the aorta, passing distally. Grossly these lesions are found in all coats of the vessel. The intima is thickened and light colored because of localized plaques of new connective tissue. The media is scarred and thickened because of microscopic gummata throughout it. The adventitia contains light colored, nodular plaques, which make it possible to recognize syphilitic aortitis very often by simply looking at the exterior of the vessel. Microscopically these lesions are all similar. They consist of very small areas of necrosis surrounded chiefly by lymphocytes, rarely a giant cell, and more or less effort at repair, depending on the reaction of the tissues. The new connective tissue formed in the healing of the lesions is like all other new tissues, somewhat atypical, that is, nature practically never perfectly

\*Read before the Jefferson County Medical Society May 18, 1931.



repairs its destructive lesions in the body. The new cells are not perfect reproductions of the old; the elastic tissue is less elastic, the sarcoplasm is less contractile and in the case of the skin, the adnexas are not formed; so this repaired vessel is not as capable of enduring the wear and tear of life as well as the original. It is more apt to break and degenerate as the result of use. It is less elastic than normal; much of the muscle tissue is destroyed and is not replaced. Whether or not the lesion begins as an end-arteritis of the vasa vasorum, or whether it is the result of localization of the organisms in the tissues with secondary necrosis because of toxic damage to the cells, is still a matter of debate. At the present time the latter view is probably the more acceptable.

**HEART:** The opinion of physicians in regard to syphilis of the heart varies between two conditions: One describes a heart that is damaged because of disease of the blood vessels resulting in over-work of the heart and decompensation. The other view is that syphilis of the heart should only be called such when it is shown or believed that the organism lodges in the heart muscle and there produces lesions which are characteristic of syphilis. The latter view is the more sensible one and the one which should be adhered to, and it is unquestionably true that *treponema pallidum* does localize in cardiac muscle and there produces lesions which are of considerable extent. The lesion, as elsewhere, consists of a small focus of necrosis beginning in the stroma and destroys muscle tissue by extending into it. The action of the muscle tissue is afterward interfered with by the firm scar of the stroma, and to a less extent by the destruction of muscle cells. I have here a case in point. The aorta which is here demonstrated shows it to be dilated and very marked syphilitic lesions are seen throughout all of its coats. The heart, however, shows a condition only of hypertrophy; the chambers even are not dilated. Sections of the musculature showed no lesions anywhere, but the changes seen in the heart muscle are secondary to the damaged aorta, and in no sense are the result of organism localized in the heart muscle. This is not syphilitic cardiac disease. It is simply hypertrophy secondary to syphilitic aortitis.

**LYMPH NODES:** Frequently, especially late in the course of the disease, the *treponema pallidum* localizes in lymphnodes. Here the most common lesion is a very small gumma in which the attack is chiefly on the stroma of the node, with some destruction of lymphocytes in the immediate vicinity. The secondary scarring results in the production of firm scar tissue, slight enlargement of the organ which makes it possible to palpate the

nodes if they are near the surface.

**LIVER:** The liver is commonly attacked and here the chief reaction is that of the connective tissue or stroma. The organism tends to be localized between the liver cords and as a result of damage to the stroma there is repair of it with subsequent fibrosis and this connective tissue separates the liver cells from the blood stream, thereby causing their atrophy and often necrobiosis. The result is a disappearance of parenchymal tissue with an increase in stroma and we see the peculiar picture of isolated liver cells surrounded by dense connective tissue, in other words, a peri-cellular cirrhosis. Gradually the liver becomes firm, light colored and roughened. The gnarled liver is produced by larger gummata which destroy relatively large portions of liver tissue and then the organ is misshapen by the contraction of scar tissue produced in the healing of these gummata. These processes may continue until the liver is practically a spherical organ having lost all resemblance to its original shape.

**MENINGES:** The chief lesions in the meninges are those which have been emphasized so often by Doctor Warthin. Grossly they consist of very fine, light colored plaques in the arachnoid. Their diameter varies from about  $\frac{1}{2}$  to 2 mm. Microscopically we see that they consist of small areas of destruction of the delicate membrane surrounded by young tissue which attempts to repair the defect, and great numbers of lymphocytes. Sometimes the lymphocytes are so numerous and conspicuous that the area of tissue destruction is visible only with difficulty.

**BRAIN:** In the brain substance we find similar lesions to those in the meninges and here they are grouped about small blood vessels for the simple reason that it is only here in brain tissue that we find connective tissue which the organism is so fond of attacking. These are essentially, as elsewhere, small gummata. This is not the pathology which is described as that of general paralysis for in this condition the organisms attack primarily the brain cells. Embryologically nerve cells are epithelial in character so in attacking them they have not departed far from their common diet.

There is much discussion as to the recognition of syphilis in latent conditions. Some individuals believe that all collections of lymphocytes about small blood vessels or small areas of necrosis are syphilitic. However, it does not seem reasonable to say that all such lesions are syphilitic because the destruction of tissue is characteristic in a number of infections, for instance, tuberculosis, pyogenic infections of various sorts, leprosy and others.

To call every collection of lymphocytes a

syphilitic lesion seems a fancy, even though some of them have been demonstrated to be syphilitic by finding the organism. It must be borne in mind, however, that the lymphocyte is not present in the lesion because of the presence of the *treponema pallidum*, its chief function is to aid in the repair of the dead tissue and in most infectious diseases we find the lymphocyte playing the same role of repair.

### DIAGNOSIS OF LATENT SYPHILIS\*

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The term latent syphilis would presume a persistently negative Wassermann reaction with no pathological process in any organ as well as no outward manifestations of the disease, which in the absence of history, would present a most difficult problem in diagnosis. To my mind concealed or endo-syphilis would be a much better term, as this period of syphilis often shows pathological processes in aorta, meninges, brain, testes, cord, etc. So-called latent syphilis may exist as early as the end of the second year after the initial infection if improperly or inadequately treated. During this period the parasites may remain totally inactive in the tissues and excite no tissue reaction, or they may be mildly active and provocative of sufficient tissue reaction to afford a positive serological reaction. As an example of the former, the parasites may be sealed in the scar of the healed primary lesion. This condition is often referred to as the "chancre redux," although trauma may result in breaking down this barrier of scar tissue and their gaining an entrance into the blood and lymph channels, or by a gradual increase in number and virulence they may result in a local breakdown and produce a small miliary gumma. Clinically, however, this stage of the disease is usually characterized by absence of incriminating signs and symptoms, and is only accidentally discovered by a most careful routine examination, perhaps with some other disease in mind.

Primarily, a physician should always keep syphilis in mind as the most likely cause of vague, indefinitely described symptoms of the patient, always remembering that this disease is no respecter of race, creed, color, nationality, or social attainment.

The presence of old pigmented scars usually smooth, most often found on the lower extremities, though sometimes found in other locations, as the scars of healed gummas of the cranium, are always sus-

picious. Again the osseous system may present lesions only discovered by a most careful examination such as enlargement or tumefaction of the inner end of the clavicle, the saber tibia, or the scaphoid scapula often overlooked by careless examiners.

X-Ray examination of the long bones may bring to light inactive proliferations which give slight subjective symptoms, or trauma may bring about activity in these bone lesions. The study of neuro-syphilis is most important, and involvement of this system may occur very early after infection; in fact, even before the secondary lesions of skin and mucous membrane. According to many good authorities, it would seem that frequently intensive and prolonged treatment may result in clinical cures along with reduction of blood Wassermann to negative during the first few months and its remaining so, never allowing it to become again positive. Of course, the spinal fluid should always be subjected to the four classical tests as early as the end of the first year, and every six months thereafter until at least three negative reports are received, as positive reports may be delayed for months or years.

To simplify our study of hidden syphilis, it might be wise to think of two stages, as suggested by Ravaut of St. Louis Hospital, Paris. First: The pre-clinical period, which is purely biological and does not manifest itself by any clinical sign, being only revealed by lumbar puncture. This period starts with the first meningo-vascular lesion produced by the spirochetes, its course is often insidious, prolonged, and results in quiet degeneration and final destruction without any external manifestations of disease until late clinical symptoms make their appearance.

After this follows the clinical period, and it is only now that neuro-syphilis may be diagnosed clinically. Remember that hidden syphilis may be either of the acquired or the congenital type. Consultation with a capable eye, cardio-vascular or neurological expert is imperative, and often discloses changes which are pathognomonic of syphilis.

Syphilis is primarily a disease of the vascular system, later extension to the skin, joints, internal organs, bones and nervous system may occur. In fact, no organ of the body is immune to its ravages. Its essential pathology is the same in the chancre where a plexus of vessels show infiltration with cells arising (in situ) through infiltration. On cross section these vessels show the characteristic concentric thickening and infiltration. All of these changes are shown in the late lesions even to the smallest perivascular infiltration.

Post mortem examination of the meninges

\*Read before the Jefferson County Medical Society May 18, 1931.



may disclose focal thickening, fibrosis in old syphilites as a result of the latency of this disease, where formerly gummatous changes were thought necessary to a positive diagnosis. The hearts of practically all latent male syphilites show latent changes varying from a few minute microscopical areas of increased stroma nuclei, plasma cells and lymphocytic infiltration to more diffuse areas of interstitial myocarditis. These lesions are usually intermuscular rather than perivascular, and are fairly rare in the female. Recently on autopsy of fifty hearts of paretics, all showed latent myocardial lesions. "Rheumatic heart" is a most common clinical diagnosis of the cardiologist in the face of no valvular changes. Spirochetes are very frequently found in these infiltrations, and cardiac death is the most frequent form in the latent syphilitic, in reality an insufficiency rather than a degeneration.

Aortic changes are practically always present in the male and in a majority of females.

These changes are rarely apparent on inspection, but microscopically show themselves in the form of perivascular infiltration along the vasa vasorum. These perivascular lymphocyte and plasma cell infiltrations are always more marked in the adventitia of the aorta. There is found the same coat-sleeve changes in the nutrient arterioles as in the primary chancre, resulting in the obliteration of these minute vessels through a progressive slow infarction or fibrosis of the intima and medial coats. These identical vascular changes are frequently found in the liver, pancreas, and adrenal glands. It is most important to remember that the testes of all latent syphilites sooner or later show specific interstitial orchitis as evidenced by atrophy of the germinal epithelia and hyaline fibrosis of the basic membrane of the seminiferous tubules. This insidious process may result in atrophy and hyaline degeneration of these organs, or normal size and consistency may be present. Latent syphilis produces a permanent loss of spermatogenic function in a great majority of cases, associated with premature loss of sexual power and desire.

Latent lesions of the prostate and ovaries are rare. In congenital syphilis large numbers of spirochetes may be found in these organs without accompanying lesions, while on the other hand lesions containing spirochetes have been found in the cervix, uterine wall, and broad ligament. The Wassermann test, so valuable in early syphilis, is rarely positive in adult congenital syphilis. The high arch palate, harelip, scaphoid scapula, short arms, hyperplastic teeth, or a general inferiority should suggest this disease. Eye le-

sions which are most characteristic of syphilis are Argyle-Robertson pupil reacting to convergence but not to light, a symptom of tabes and parietic dementia, and may precede these diseases by many years. These conditions may also be due to an alcoholic neuritis. Interstitial and parenchymatous keratitis, probably account for 65% or 70% of these cases in congenital, and 10% in acquired types, most frequently appearing between the ages of five and fifteen years, occasionally as early as the third year and rarely after the thirteenth year. Choroiditis often accompanies interstitial keratitis, and these children present a remarkable combination of defects, such as a dwarfed statue, coarse, flabby skin, and sunken nasal bridge, with scars at the angles of the mouth and nose. Hutchinson teeth, deafness, chronic periostitis, synovitis of the knee joint, and chronic indurated lymphatic glands.

Interstitial keratitis of the acquired type contrasts in that it is usually a late secondary or tertiary lesion appearing between the twentieth and fiftieth year, and is more amenable to treatment, more typical, and frequently accompanied by other symptoms. Differential diagnosis from tuberculosis is necessary. Scleritis due to syphilis, which presents a chronic course, very painful, unaccompanied by secretion is frequently diagnosed as iritis or conjunctivitis due to other causes. While iritis is an early manifestation of syphilis, appearing between the second and ninth month, occasionally delayed to the eighteenth month, it may also appear as a late manifestation, either as a primary iritis or as a gumma of the iris. Retinitis in its various forms, including the types with exudate as well as those with hemorrhages and degenerative changes, may be found in both the acquired and congenital types.

A rather common syphilitic ocular lesion is paralysis of one or more of the extrinsic muscles of the eyeball. Late statistics would indicate from 60% to 70% of the cases of ocular muscular paralysis as due to syphilis and while generally a late manifestation it may appear as early as the sixth month after the primary infection; particularly in the form of ptosis. Rarely paralysis of the ocular muscles result from congenital syphilis. The third nerve is not often affected by syphilis, while the sixth seems to be most often due to toxemias such as those accompanying rheumatism, influenza and diabetes. Paralysis of the ciliary muscles, the chief symptom of which is loss of accommodation, either complete or partial, is occasionally due to acquired syphilis but rarely to the congenital type.

In my experience of about fifteen years, which probably includes several thousand

cases, I have found the aid of the pathologist, the cardiologist, oculist, and neurologist most valuable in the diagnosis of obscure cases of this most dreaded disease, and most frequently the oculist refers patients for treatment with the diagnosis made from positive eye findings which are almost invariably correct.

## THE TREATMENT OF LATENT SYPHILIS\*

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The term latent, as applied to this disease, really means concealed, quiescent or not manifest. When a disease is without symptoms, the patient is unaware of its existence, hence the likelihood of consulting a physician during this period would be improbable. The above title, as used by a great many writers and as given me by the program committee, more properly would be "The treatment of old chronic and late syphilis."

In a treatise on the treatment of old chronic and late syphilis, it is impossible to confine ourselves to the mere application or the names of drugs. We must necessarily consider the organ or organs involved, the underlying pathology and the effect and action of drugs upon them.

I am sure most of us will agree with our friend and member of this society, Dr. Edward R. Palmer, that latent or old syphilis of today has "changed in type and character" from what it was years ago. Even twenty years ago I can remember as a senior medical student, the outpatient departments at the old 6th and Chestnut Clinic, where syphilitic leg ulcers, periostitis, condylomata and old perforated nasal septa were the usual pictures of this disease. Old syphilis of today seems to principally involve the internal organs, the cardio-vascular system and the nervous system. That these internal conditions were seen twenty years ago we all admit, but their number certainly seems to be on the increase. This fact leads one to the following thoughts:

First: Has the disease, which is caused by the same spirochete as the old, changed? The answer is—this would be most improbable.

Second: Has the treatment of early syphilis, which has decidedly changed, been the chief factor in this transformation? It would seem the more logical to believe that here would rest the cause of such change. Have syphilologists relied too much on arsenic and laid aside the old reliable mercury?

Third: Has the so-called intensive treat-

ment of early syphilis driven the organisms into the internal organs, and instead of destroying them, leaves them to lie imbedded in the tissues and slowly but surely to cause severe damage to the organ lodging them?

Fourth: Since it has been proven by numerous investigators, and later admitted by Ehlich himself that all the spirochetes cannot be killed by any one dose of an arsenical, can it be that the defensive mechanism of the body, that important phase of reaction on the part of the tissues, whereby antibodies are produced, be interfered with by the over-irritation and poisonous action of a drug? We all know that any drug which is stimulative to the tissues in a moderate dose, is poisonous in too large a dose.

Fifth: Are very large doses of arsenicals, as frequently employed today, more destructive to the body tissue cells and their antibody formation mechanism than to the *spirocheta pallida*?

These are questions which are worth while pondering over and it is hoped that time, experience, observation and research may finally give us the true answers. Some of these questions have already, to some extent, been answered.

That there have been fatalities attending the use of large doses of the arsenicals none of us can deny. Schamberg states that doses of neo-salvarsan in excess of .45 gm are dangerous in the average individual, and only in the exceptional case does he use .6 gm. This expresses my own personal opinion, and I believe the future will reveal the general adoption, by the medical profession, of smaller doses of the arsenicals than are being so universally used today. A drug, which in a large dose, is so irritative to the liver as to produce an acute hepatitis and so violent in its effect on syphilitic involved tissues as to bring about an acute inflammatory reaction, cannot be classified other than dangerous. This is especially true if the essential lesions are in the brain, heart or liver, and it is in these cases that most of the fatalities have occurred from large doses of the arsenicals. Warthin, in a late article, states, "Under modern treatment the period of latency seems to be shortened: Neuro-syphilis and aortitis seem to be developing earlier (10 to 15 years) than under the old treatment." The common pathological picture of old chronic syphilis is a fibrosis, often having spirochetes enveloped in it. The rarer form is the gumma, which when present, is most frequently associated with a fibrosis. Warthin, states the "lesion of latent syphilis repeats the pathology of the primary lesion; in other words, cell proliferation with infiltration." (Vascular and peri-vascular infiltration with plasma and lymphoid cells; cells of the ves-

\*Read before the Jefferson County Medical Society, May 18, 1931.



sel wall and surrounding tissue.)

The Four Horsemen in the battle against syphilis at the present time are mercury, iodides, arsenic and bismuth. There are also reconstructives, such as cod liver oil, which, with iron, act as reinforcements and often help turn the tide of battle. There are but few old chronic syphilitics that are not anemic and strange to say, a great many men who treat this disease, seem to overlook this common coincidental condition. In looking over the literature on the treatment of this disease, there are but few who even mention the value of iron in assisting our patients to combat this disease. All of us realize the importance of a good hemoglobin content in the blood to assist nature to the fullest extent in overcoming any infection. Why it is so frequently overlooked in treating late syphilis, I do not know. I believe, like our good friend, Dr. Palmer, that mercury is still the outstanding drug in the treatment of syphilis; and this applies to any stage of the disease. It does make a great difference as to how mercury is used. It should be given daily, or nearly so, so that there is a constant and regular absorption of the drug. To use mercury in this manner, it can only, with practical application, be given by mouth or by inunction. There is but very little need to ever give a hypodermic of mercury. The hypodermic use of the insoluble salts, in an insoluble base (insoluble to the tissues) is not satisfactory for the following reasons:

First: Most of them are painful for hours and at times even for days.

Second: The absorption by the tissues of insoluble drugs, in tissue insoluble media, is always variable and uncertain in different people.

Third: It has been proven, in the army, that many of these injections become encysted and remain so for years.

Fourth: Abscesses, following at the site of injection, are not uncommon occurrences.

There are patients who cannot tolerate mercury by mouth, owing to gastro-intestinal irritation. Again, there are those who cannot tolerate the drug in but the very smallest amounts, even by inunction. I have a patient now who can tolerate but 1/4 drachm of mercurial ointment every third day by inunction. More than this amount causes him to feel nauseated and he loses his appetite almost completely. Patients who develop an active dermatitis also contraindicate the inunction method.

As regards the treatment of late syphilis of the internal organs, with perhaps the exception of severe and badly damaged kidneys, it should be the general policy to put these patients on an intensive mercury treatment for at least two to four weeks before any arsenicals should be used. That there

are exceptions to this statement is apparent to all of us. There is the gastric crisis and the "lightening pains" of locomotor ataxia, which in my limited experience, have been slow to yield to mercury. A small dose of silver-arsphenamine (.2gm) or if there are no eye findings contraindicating, an injection of trypanamide may be necessary to assist in overcoming these troublesome symptoms. Again, I do not believe the finding of an albuminuria and casts, without the presence of erythrocytes, would be contraindicated to the cautious use of small doses of mercury. If the picture is one of an acute congestive nephritis, it would seem more logical to depend on the arsenicals in small doses until the urinary picture made a change for the better before mercury be given.

Experimentally, since the successful culture of the *spirocheta pallida* has been made possible in the laboratory, it has been shown that the exogenous toxin of the spirochete is productive of but little reaction on the part of the tissues of an injected animal; nevertheless, the endotoxins do cause some reaction, as has been proven by the injection of the macerated dead organisms. This may be true from the standpoint of animal experimentation but it is questionable if it is true in the human body. There are comparatively few animals where inoculation of syphilis is successful, therefore it is difficult to draw logical conclusions from such an experiment. This action is contrary to that of the ordinary bacteria, whose exogenous toxins are potent and rapid in their action. It is perhaps because of this finding that syphilis is described as a disease of slow evolution. These facts must be considered when selecting drugs to be used to combat it in man. Mercury is perhaps inhibitive to the development of the spirochete and as such either through prolonged action causes final death or by attenuating the organism, allows antibody to destroy it.

It is the opinion of many authorities that arsenic is the most spirocheticidal of all drugs. If this be true, it can account for the acute reaction on the part of the tissues of old syphilis, when a very large dose is used. If it causes a rapid death of some of the spirochetes and since the toxins that are most damaging are endotoxins, their sudden liberation would be responsible for this phenomenon of acute inflammatory reaction.

There are those who believe the chief action of the so-called anti-syphilitic drugs is as pronounced upon the specific involved tissues as upon the spirochete itself. The action of these drugs is stimulative to the plasma cells, these cells contain granules from which a local anti-body is to be formed. Complement is a lipoid-globulin, which, after proper arrangement of its molecular con-

stituents, becomes anti-body, and as such is capable of uniting with antigen and rendering it inert or harmless to the body. There is perhaps but one complement in the body by which nature combats all infectious diseases. Each organism differs in its protein molecule and complement must first be rearranged before it is actually anti-body. Ordinary bacteria differ from the spirochete of syphilis, because their exogenous protein molecules are powerful poisons and are therefore more stimulative to the anti-body mechanism than the exogenous toxins of the spirochete which have been proven, at least experimentally, to be very mild. In luetic infections this can explain how the organism can lie dormant for so many years without nature being stimulated sufficient to manufacture enough anti-bodies to overcome the infection. That there are exogenous toxins is demonstrated by the reaction of the tissues in a chancre and by the often irreparable damage to the tissues in old chronic cases. I believe the most logical attitude to assume on this phase of drug action is that drugs act both on the spirochete as well as upon the tissue involved. While animal experimentation is often fallacious when the principles are applied to the human body, yet much knowledge has been gained therefrom and I think the work of Kolmer has some foundation, as proven by clinical facts, when he concludes that the endotoxins are more powerful than the exogenous toxins of this disease. From this it seems that in old or late syphilis we must actually destroy some of the spirochetes, inasmuch that nature can be stimulated, through liberation of antigen to rearrange complement so that it can be active in its anti-body content. We must not forget, that in any infectious disease, it is the presence of a specific toxin that causes nature to manufacture a specific antitoxin or anti-body and that drugs can only act as assistants in this complicated process. To clarify this last statement, I mean, that it is only by the presence of antigen that the anti-body mechanism is brought into action in producing a specific anti-body. Chemicals of their own accord, without antigen, cannot do it.

When death has occurred after a large dose of the arsenicals, at autopsy the old lesion or lesions present the picture of an acute inflammatory reaction having taken place. This phenomenon can be explained along two separate lines:

First: If arsenic causes rapid death of the spirochetes in an old lesion, the sudden liberation of the more powerful endotoxins in their effect on the tissues, overcomes anti-body present and exerts marked irritation.

Second: There are those who believe arsenic in large doses damages the local anti-

body mechanism to the extent that the organism is moved to new activity.

It makes but little difference which of the two theories you accept, it brings us back to what has been said before, that mercury should generally precede arsenicals in the treatment of old lues and that when arsenic is used, a very small dose should test the patient's tolerance and the effect it has upon the disease present.

In old chronic syphilitic lesions, there is an apparent zone of inhibition about and around same. In this area is found protein-split products, due to activity of the organisms present, which attract complement and cause its fixation. In turn this allows the spirochete to thrive in that a protective wall as it were, is formed. It has been found that part of these products of protein cleavage are unsaturated fatty acid radicals. It is here the iodides, by their combination, exert a solvent action and prevent the further fixation of complement.

The iodides seem to be in the background today and many writers apparently overlook their value. They exert a powerful solvent action on granulomatous and indurative tissue and allow complement access to the embedded spirochetes. They should always accompany our other drugs in treating this condition. There are two exceptions, however, that should be mentioned. Aneurism and tuberculosis. There are patients who tolerate the iodides very poorly and have rather severe reactions. Strange to say, many of these have the best iodide result, insofar as the disease responding is concerned. There are indeed not many who cannot tolerate a few grains of iodide at bedtime, once a day. That the body reacts or is over sensitive to this drug should not deter us in its use. The iodides increase the penetrability of our other drugs.

Bismuth has come into prominence of late and some of our leading authorities lay great stress on its value, especially in those patients who do not tolerate mercury very well. A water soluble salt, soluble to tissue absorption, would seem preferable to the suspended oily solutions for the same reasons as given before. Bismuth sodium tartrate (Searle), each 2 c. c. ampoule containing .03 gm of the salt, is the one I usually use; it must be given intramuscularly. If given in the fatty subcutaneous tissue it can cause severe irritation. Ferguson claims it is more effective in old lues than arsenic. He combines it with K I and alternates with mercury. 62% of arsenic resistant cases became negative. Bismuth, like mercury, exerts its chief irritant action on the kidneys and regular urinalyses should be made while it is being employed. Bismuth in combination with arsenic (Bismarsen or Bismuth-Arsphenamine Sulphonate) is recommended by Kolmer in cardio-vascular



syphilis. It is only used intramuscularly. In my own limited use, it has been rather painful and some patients object to it. Schamberg states that silver-arsphenamine is the most efficacious drug in syphilis that we possess, if we are to judge from its effect in the experimentally infected rat. It is of value in neurosyphilis, in late manifestations of congenital lues and old resistant forms of the disease. There is sulpharsphenamine, which like Bismarsen because of its intramuscular use, is of great value in treating congenital lues in children.

In a paper of this type, on a subject where there are numerous contributions to the literature, each author having his own theory and his own experience, the apparent difficulty with me, is knowing just how to conclude. I do not believe that routine dose of a drug, a set routine time and management of treatment, can be of any permanent value, if applied to all patients presenting themselves. When we follow a beaten path, we lose the right to exercise our own judgment and original individuality, which combination is as essential to the ultimate welfare of our patients as to the future advances of medicine. It is impossible to go into detail as to the treatment of chronic syphilis of each individual system or organ, in one short paper. Each one is a symposium in itself.

Before closing, the most important question to be answered still remains: when is our patient cured? A question that I do not believe anyone, at this time, can answer with certainty. Warthin, in his latest article states, "Modern treatment, like the old, results only in a clinical cure; in no cases have I seen an absolutely inactive instance of syphilitic infection. On a careful search, active latent lesions have always been found in my material." Later on he says: "A negative Wassermann reaction is of very little value in excluding the presence of latent syphilis. The Kahn test shows a much greater degree of accuracy." Kolmer states that as long as the blood or spinal fluid is still Wassermann positive, there is a likelihood of the body harboring live spirochetes. On the other hand, too prolonged intensive treatment does the patient harm and periods of rest, with tonics and proper hygiene, are essential to our patients wellbeing.

Since we cannot rely upon the Wassermann reaction as implying an active or inactive infection, the only good that can be accomplished there from is comparison with previous reports. Would it not seem logical to assume, if a patient had a negative Wassermann for say three to five years after all intensive treatment had been discontinued then to find it again positive, that the disease was again active? I feel like such would be the case and that this finding would be of some value to us in indicating the amount

and intensity of further treatment.

Warthin's findings are very discouraging as to any case ever obtaining a complete cure, yet most of us feel like we must see a negative blood and spinal fluid before we are satisfied to temporarily give our patient a prolonged rest.

Perhaps the ideal to be attained would be:

First: A yearly Wassermann and Kahn test on blood and spinal fluid, solely for the purpose of comparison, in that by a positive increase, an active latency may be discovered before clinical signs are manifest.

Second: All patients, regardless of negative laboratory tests, be given a four to six weeks treatment of mercury and iodides, once a year, for the remainder of their lives. This should increase that period of latency to such an extent the patient finally will die of old age or of some other disease, which is common to us all.

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#### DISCUSSION

E. R. Palmer: Mr. Chairman and members of the Jefferson County Medical Society: I wish at first to express my appreciation of this most excellent presentation of the subject Latent Syphilis and I am happy to state that for the first time in many years I find myself in agreement with almost all that has been said. This seems to imply that I have at last struck my colors; have given up the fight and like the prodigal son am now ready for the fatted calf. But careful consideration of most of the statements that have been made by the essayists will show that my agreement is due to the fact that the ideas expressed here tonight concerning syphilis and its management are now more in accord with the position I defended before this society more than ten years ago; and which I still maintain is correct. At that time mine was a voice almost alone in a wilderness of opposition, but today as Dr. Gaupin has pointed out such a prominent pathologist as Warthin states that while arsphenamine prevents the appearance of external manifestations and rapidly causes the resolution of the initial lesion, it does so apparently at the expense of the internal organs, cardiovascular and central nervous system by rendering the disease latent. That by it the time of the oncoming of the latency shortened, and the incidence of neurosyphilis and internal syphilis is increased. Moreover he also as Dr. Gaupin pointed out calls attention to the fact that many European syphilologists

believe that the immunity to the late destructive lesions that is derived from secondary manifestations is better and more likely to be permanent than those produced by the arsenicals.

So slowly but surely the pendulum of medical opinion is swinging back. In order to handle a case of latent syphilis to the best interest of the individual concerned, it is essential that we have as clear a conception as is possible of, first, the pathological process that is taking place. Second, just what tissues or organs are involved and to what extent. Third, how the body is attempting to correct this condition, and fourth, how anti-syphilitic drugs act and what is the difference in the mode of action of the different drugs. And finally what drug or combination of drugs is best suited to the case in hand.

The first thing we must realize is that we are not treating an entity, latent syphilis. And above all we are not treating a 4 plus Wassermann reaction, but an individual who is suffering from a condition due to syphilis. Our object then is not simply to rush blindly in and by mass attack slaughter spirochetes but to relieve our patient from suffering and restore the tissue involved to as near a healthy condition as possible. It is a serious mistake in many of these cases to recklessly pour in drugs, whether arsenic, bismuth or mercury, in the hope of permanently converting a positive Wassermann to negative for by so doing you will often wreck the health if not hasten the death of him whom you would help.

Dr. Miller has beautifully demonstrated to us the pathology of many of the lesions of latent syphilis. We must bear in mind always as Dr. Miller has demonstrated and Reasoner says that "No matter at what stage a syphilitic reaction develops, it is essentially a granuloma having its origin in the peri vascular lymph spaces." It begins as an endarteritis then a peri arteritis which is followed by an infiltration of the lymph spaces with Mononuclear lymphocytes and plasma cells. It is the character of the ultimate evolution of these inflammatory exudates that determines the type and degree of the resulting injury. And it is evident that the proper management of internal syphilis depends more on how successfully we deal with this granuloma than on killing spirochetes and rendering a Wassermann negative.

What is the nature of this granuloma? What is the body trying to accomplish with it? It is certainly wrong to look upon it as wholly a harmful state of affair. We must recognize that it, like all other inflammatory exudates is primarily a defensive and secondarily a reparative measure and only becomes pathological and harmful when through the virulence and prolongation of the action of the spirochete the continued presence and activity of both combatants causes destruction of tissue in the field of action, the cells of the granuloma then

either undergo their normal transformation in the connecting tissue replacing the destroyed area with a scar. As in the case of posterior spinal sclerosis and Hepatic sclerosis are then the occlusion of arteriosis and consequent lack of blood supply local necrosis results in the form of a gumma which is itself eventually replaced with a scar. These lymphocytes and plasma cells are a defense against the spirochetes not only by walling them in but also by the local formation of anti-body.

In 1920 I predicted that eventually a positive Wassermann would be obtained from the juices of a chancre and in 1921 Klander and Kolmer succeeded in demonstrating this. Moreover, McDonough has extracted complement from satellite lymph glands. From these facts it is evident that there is a local as well as a general anti-body formation.

In primary and secondary syphilis the lesions are intrinsically, the same as in latent syphilis, differing only in being more discrete, less massive and having a tendency to undergo complete resolution with a restoration of the involved tissues to a normal condition.

That is what the body is attempting to do in all stages of syphilis, and our treatment should be such as to favor rather than to hinder this effort.

Has that been accomplished by the modern methods of early intensive treatment with arsenic? I have from the first claimed that it has not. And the findings of pathologists now seem to support my contentions. It is only indirectly that my fight has been against arsenicals, the main attack being against the method of treatment which I believe I have proven, is based on a false theory of the action of drugs and since arsphenamine is the key stone of the arch which upholds this theory, I am endeavoring to dislodge it. In syphilis an ounce of prevention is worth a pound—nay a ton of cure, so the quicker we free ourselves from the fallacy of chemo-therapy the quicker we recognize that anti-bodies alone kill spirochetes and our drug act only as parasiticide and catalyzers, the sooner will we see in my opinion a decline in the incidence of internal syphilis or so-called latent syphilis.

#### Relation of Phrenicotomy to Cardiospasm—

In order to get some data on the possibility of cardiospasm following phrenicotomy, Ernst got in touch with 179 patients who had been subjected to this operation during the years 1921-1929. Those operated on recently were examined with the roentgen ray. In none of the 179 cases was there any evidence that cardiospasm had supervened following the operation; however, it is important that phrenico-exeresis should be performed only after indications have been weighed carefully and it is determined definitely that the operation can and should be done.



## PHYTOBEZOR \*

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Lexington.

Patient is a white female, age 52, single. Complaint: constant dull pain in stomach for four days.

Family History: Father died age 35, of tuberculosis. Several paternal and maternal uncles and aunts had tuberculosis.

Past History: Patient has never been strong. She states that she has had three attacks of "hemorrhagic purpura" and "came near dying from each one." Last attack was in 1914. Tonsillectomy in 1920 followed by deafness in right ear. As early as she can remember she has suffered at intervals with epigastric distress, distention and pyrosis after meals and occasionally nausea and vomiting. After remaining on a liquid diet a few days the symptoms would disappear. In May, 1924 she came to us complaining of heaviness and distention in the epigastrium which had been present three or four months. Following the distention a dull boring pain was present in right hypochondrium, which at times was severe. Fluoroscopic and x-ray examinations of gastrointestinal tract and gall bladder were negative. On several occasions she has been treated for "colitis," the last one being in 1919. Since 1906 has been constipated and never has a stool except from laxatives or enema. Ischio-rectal abscess opened and drained in 1924 and a sinus remains.

Present illness: On the night of November 29th, 1929, patient ate supper at 6 p. m. About 11 p. m. began having dull aching and cramping pains in epigastrium accompanied by nausea but no vomiting. Took a dose of Epsom Salts that night and castor oil the next morning followed by thorough evacuations. Since then has had waves of nausea and a constant dull pain in epigastrium and pyrosis. She has been unable to drink or eat without the pain increasing. The only nourishment taken the past four days has been one cup of bouillon daily. Soreness is general throughout the abdomen but especially marked in epigastrium.

Patient has had two other attacks similar to this one. The first attack occurred early in the spring 1929 and the other one in June. Each attack lasted about two days and improvement followed a purge, although the abdomen remained sore and tender for about a week.

Physical Examination: Patient looks weak and ill, and walks as if abdomen is quite tender. The epigastrium and left hypochondrium are acutely tender while the remainder

of the abdomen is not so much so. There is no rigidity. A mass the size of a thumb is palpable to the left of mid-line of epigastrium and moves with respiration and feels like a portion of contracted bowel. At times vigorous peristalsis is visible in left hypochondrium and epigastrium passing towards the mass where it stops. During peristalsis the mass can be felt enlarging and as the peristalsis subsides the mass returns to its former size. At the time of the peristalsis the patient complains of an increase in the intensity of the pain. The remainder of the physical examination is negative except for sinuses on each side of anus.

Laboratory Examinations: Blood and urine negative.

X-ray of stomach and duodenum: multiple large and small filling defects involving the stomach from near the fundus to the pyloric antrum. The antrum is almost completely filled by one large mass. There is very little involvement of the curvature. The rugae immediately adjacent to the defects appear normal, and the gastric wall between the involved areas is flexible with normal peristalsis. Diagnosis: multiple gastric tumors, probably benign. (D. S. H.)

Operation: Spinal anesthesia. Pre-operative Diagnosis: Multiple polypi stomach. Operative Diagnosis: multiple bezoars. Operation done, gastrotomy; removal of foreign bodies.

Findings: There were three rather firm masses within the lumen of stomach, the largest of which was the size of small orange smallest size of walnut. They were shaded from dark to light sea green. These three masses when fitted together formed a mold of the stomach. The gross appearance is that of a phytobezoar. The largest mass was in the fundus and smallest mass was in the antrum of the stomach, so placed that it probably acted as a ball valve in the pylorus. The gastric mucosa was normal in appearance. Gall-bladder was of dirty gray color apparently infiltrated with fat. The bile passages were not palpated because of fear of soiling. Lower abdominal organs not examined. Procedure high left rectus incision. Stomach was opened with transverse incision through its body, the bezoars removed, and incision closed with triple layer intestinal catgut. Layer closure of abdomen without drainage.

## PATHOLOGICAL REPORT

Gross: The specimen consists of three bezoars weighing 76, 93, and 11 grams respectively, a total of 180 grams. They are roughly faceted and the surface of each is covered by a greenish deposit. Sections through the larger mass shows a uniform consistency. A cheesy material binds together vegetable husks. No lamination could be demonstrated.

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

Diagnosis: Phyto-bezoars. (E. S. Maxwell.)

Subsequent History: Patient has always been fond of persimmons and has eaten rather large amounts of them. The night of November 29th she began eating persimmons about 7:30 p. m. while reading and by 11 p. m. when the pain began, she thinks she had consumed slightly less than a pint of them.

The patient made an uneventful recovery and is in better health today than she has been in years.

### CHRONIC DEFORMING ARTHRITIS: TREATMENT BY SYMPATHETIC GANGLIONECTOMY\*

R. GLENN SPURLING M. D., AND  
FRANKLIN JELSMA, M. D.

Louisville.

Introduction: About 2 years ago, one of us (1) published a preliminary report in the Kentucky State Medical Journal upon, "The Effects of Sympathetic Ganglionectomy in the Treatment of Two Cases of Chronic Deforming Arthritis." At that time, the procedure was still in the experimental stage and no definite conclusions could be drawn as to its lasting beneficial effects. Now from our own experience and that of others (2, 3, 4, 5), we feel justified in making a more critical analysis of results and perhaps help place the procedure in its rightful category in the treatment of this most baffling disease.

Not all cases of deforming arthritis will be relieved by sympathetic surgery. As a matter of fact, only a relatively small percentage of those suffering from this disease will be benefitted. First of all, before considering indications for the operation in arthritis, let us review the known facts relative to the physiological effects of cervicodorsal and lumbar sympathetic ganglionectomy.

When the inferior cervical, first and second dorsal sympathetic ganglia with their intervening trunk are removed, the following changes are known to occur:

1. There is a marked increase in surface and deep temperatures in the upper extremities, neck and face. This increase in temperature is due largely to the removal of the vasoconstrictor mechanism to the blood vessels of these parts. In other words, the blood vessels dilate, and more blood is carried through the parts, hence an increase in local heat.

2. The sweating mechanism is abolished over the same areas. The skin remains warm and dry. Presumably, the loss of sweating

mechanism is responsible for some of the increase of heat, inasmuch as evaporation is greatly reduced.

3. The pilomotor mechanism is abolished over the same areas.

4. A more or less permanent Horner's syndrome is produced due to the partial interruption of the sympathetic mechanism to the head.

After removal of the second, third and fourth lumbar sympathetic ganglia with their intervening trunk, the same effects upon the blood vessels, sweating and pilomotor mechanisms are noted in the lower extremities as observed in the upper extremities. In addition, the dilator mechanism to the lower part of the colon is interrupted, but this apparently has no clinical significance in persons with normally large bowels.

With the above physiological factors on sympathectomy in mind, it is readily appreciated that the only effects which would be beneficial in the treatment of arthritis would be the increase of heat due to the change in the vascular supply and sweating mechanism to the extremities. Application of external heat and the institution of various physiotherapeutic measures to increase the blood supply to the involved parts have been the ages old methods of treatment. Sympathectomy, therefore, is merely an elaboration of these methods by providing a constant increase of heat and a more adequate blood supply to the parts involved.

Selection of patients: To attempt a classification of the arthritides would be beyond the scope of this paper. From the above discussion, it becomes obvious that only those cases of arthritis associated with a deficient vascular supply to the involved parts would be benefitted by sympathetic nerve surgery. The clinical manifestations associated with a diminished vascular supply are cold, clammy, sweaty, hands and feet. Mild cyanosis is often present. These manifestations are usually precipitated by cold or damp weather. They are also precipitated by emotional excitement. Usually, these ischemic symptoms occur in the so-called "arthritis deformans" and are usually not associated with the degenerative or hypertrophic type of arthritis. Assuming that the arthritic patients present symptoms of ischemia, there are certain contraindications to sympathetic nerve surgery, such as: 1. if the febrile reaction has not entirely subsided; 2. badly debilitated patient with heart lesions, etc.; 3. evidence of peripheral arteriosclerosis; 4. fixed ankylosed joints; 5. extensive destruction of the joint surfaces; 6. marked bony spurs in and about the joints.

It is entirely appropriate to state at this time that the operation of sympathetic gang-

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.



lionectionomy is a major procedure of the first magnitude, and the patient's general condition must be carefully studied before it is undertaken. Also, no cases of arthritis should be admitted to surgery until all of the usual methods of medication have failed.

Methods of determining the degree of ischemia: Ordinarily, by palpation alone one can determine the degree of ischemia fairly accurately. When the involved extremity is colder to the touch than a normal extremity under the same environment, and when it is clammy and moist, ischemia of considerable degree may be assumed to be present. For a more accurate determination of the degree of diminished blood supply surface temperature studies should be made. There are several convenient and accurate thermocouples on the market. Unfortunately, they are expensive to own and operate. For ordinary clinical work the skin temperature thermometer is sufficiently accurate. Temperature reading should be made over all the involved parts and comparison made between temperature reading of the uninvolved parts. (Surface temperature readings should be checked several times under as nearly constant environmental conditions as possible).

Methods for testing the probable effects of sympathectomy. It is a well known fact that during a general febrile reaction, the vasoconstrictor mechanism is temporarily paralyzed and a marked vasodilatation occurs. Adson and Brown (6) devised the plan of subjecting the patient to an artificially produced febrile reaction to test the effect of removal of vasomotor control. They injected intravenously typhoid-paratyphoid vaccine and compared the rise of surface temperature with the generalized febrile reaction, thereby arriving at what they called a vasomotor index. By abolition of the vasoconstrictor tone by this artificially produced fever, they were able to prophesy with extreme accuracy the amount of temperature rise which would result from sympathectomy. We have used for the past three years a method which we consider to be as accurate and less disconcerting to the patient than the febrile reaction. Acetyl choline hydrobromide when given intramuscularly in from 100 to 200 mg doses produces a temporary paralysis of the vasoconstrictor mechanism. Surface temperature studies made before and after the administration of this drug give us accurate data as to the probable effect of the operation. Most cases of arthritis which will benefit from sympathetic nerve surgery will give from 5° to 10° C rise in surface temperature following the administration of acetyl choline. This response should be checked

several times before the operation is planned. Many patients experience considerable clinical improvement in the arthritic pain following the administration of the drug. In one case, the patient postponed the operation several months because the effect of the drug gave her such marked symptomatic relief. When this improvement occurs in the course of the preoperative test, it is an excellent index of the probable result to be expected from the operation.

When this work was first started several years ago, there was considerable discussion as to the detrimental effect upon the patient's general condition by the abolition of so much of the sympathetic nerve control. It was argued that by destroying a portion of the acceleration to the heart, the patient would suffer detrimental effects upon the circulatory apparatus. Our own studies and those of others would tend to discredit such a point of view. So far as we are able to determine, there were no serious detrimental effects, either upon the heart or other organs, associated with this operation. Many patients object to the profuse sweating that occurs about the abdomen during the warm weather. The sweating mechanism apparently adjusts itself after several months to such a degree that little inconvenience is experienced.

Clinical analysis of results: During the past two years, we have treated eight cases of chronic deforming arthritis with sympathetic nerve surgery. In four instances, only the lumbar sympathetics were removed; in one case, only the cervicodorsal chain was removed; and in the three remaining cases both chains were removed.

All patients were advanced cases of chronic deforming arthritis. (Unfortunately, we have seen no early cases of this disease). In three patients, the process was largely limited to the soft tissues about the joint with a minimum of joint destruction. Three cases showed moderate joint destruction and partial bony ankylosis with contractures. Two cases showed marked joint destruction, bony ankylosis and contractures.

All patients had evidence of ischemia in the extremities. Pain was the predominant symptom in each instance. All cases gave satisfactory responses to acetyl choline. It is important to note, however, that patients with little joint destruction gave the greatest rise in surface temperature during the diagnostic test. The duration of the disease in the patients without bony involvement was from two to three years. In the moderately advanced and advanced cases, the process had extended over periods of from 5 to 15 years. In the severe cases, especially of long-standing with intrinsic joint involvement, the op-

eration was undertaken to relieve pain which was interpreted to be largely of ischemic origin.

It is our experience that the probable result of the operation can best be prophesied according to the degree of response of the surface temperature to acetyl choline. The beneficial results are in a general way parallel to the degree of response during the diagnostic studies. This is not invariably true, however. Probably the cause of confusion lies in the fact that it is at times difficult to determine whether the pain arises from ischemia, contractures, swelling or other local causes. If the pain is purely ischemic, relief is usually dramatic immediately following the operation. In cases where the joint involvement is chiefly periarticular this type of pain is most frequently encountered. In severe cases of long-standing with intrinsic joint involvement, the prompt relief of pain is less constant. In all of our cases, the relief of pain has been satisfactory, in only one instance has the patient felt that this benefit did not justify the operative procedure. When the pain is relieved, an increase of joint motion is usually observed. In many instances, the joint is held fixedly because any movement causes pain. Unless there is complete ankylosis of the joint, some improvement in motion may always be expected.

Periarticular swelling regresses slowly. After a few months, an appreciable decrease in the swelling can be demonstrated, although it has never disappeared completely in any case of our series.

The postoperative care of these patients is extremely important. In cases of long-standing, the patient must be completely re-educated in the use of the various muscle groups. In many instances, orthopedic procedures must be instituted to reduce contractures due to tendon shortening and fibrous bands about the joint. Active and passive motion should be started within a few days following the operation. This should not be done too enthusiastically, however, because if carried beyond the point of discomfort, more damage will be done to the joint, and the patient's confidence will be lost. Baking and massage are valuable adjuncts. The usual medical treatment should be continued, particularly the elimination of foci of infection, and the treatment with autogenous or stock vaccines should an offending organism be found in any focus. General hygienic care of the patient, of course, is extremely important. The patient should be carefully instructed before submitting to the operation that improvement will be slow; it is our custom to instruct them that one year must elapse before they will be able to evaluate

the benefits which they have received.

The results of treatment in cases without intrinsic joint changes have been highly satisfactory. (Motion picture demonstration of patient operated upon two years ago). Cases with moderate joint destruction and contractures without bony ankylosis give reasonably satisfactory results. The relief of pain is probably the most important benefit given this type of case. The advanced cases with ankylosis, joint destruction and contractures give unsatisfactory results. It is our belief that this type of case had best be treated medically especially with the administration of repeated doses of acetyl choline.

#### SUMMARY

1. Sympathetic ganglionectomy in the treatment of chronic deforming arthritis is a procedure of merit in properly selected cases.

2. The best results are obtained in those cases of deforming arthritis where disability is due to periarticular swelling with a minimum of joint destruction and without bony proliferation.

3. Marked ischemia in the involved extremities is the guide to the proper selection of patients for this operation.

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**Gastroptosis: Surgical Treatment.**—On the basis of his experience in twenty-eight patients Lambret considers surgical intervention essential in the treatment of such disorders. He believes that this condition is more frequent than has been recognized heretofore and that it may be found in all patients in whom ulcer, cancer, lithiasis, appendicitis and nutritional and neurologic disorders may be eliminated. His method of operation consists of a modification of the Perthes operation, as the greater curvature is fixed by burying in the stomach wall a portion of the fascia taken from the abdominal muscles of the left side. This aponeurosis is pedicled and enters the abdomen between two ribs, being sutured to the round ligament at the point where it leaves the liver. In addition Lambret fixes the fascia in a serous canal, using the technique of Witzel. Lambret could follow the late results of this operation for more than two years in thirteen patients.



## CHRONIC MENINGOCOCCIC MENINGITIS\*

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In the year of 1805 the first outbreak of meningococcic meningitis occurred in Geneva, Switzerland. The clinical course and the gross pathology of the disease were accurately described. The following year an outbreak occurred in Massachusetts. Many epidemics occurred during the next century, but little progress was made either in understanding or treating the disease until Weichselbaum in 1887 described the meningococcic organism. The greatest epidemic of all occurred in New York in 1905 with 7755 cases and 3455 deaths. No progress was possible in the treatment until Flexner introduced the antitoxin reducing the mortality from 90 to about 30 per cent. The antitoxin today represents our only effective treatment, and it surely means a great decrease in mortality, morbidity and the number of complications. Prophylactic doses of the antitoxin are now available. Isolation of the cases in general should be more carefully watched. The organism causing the disease is a diplococci found principally in the polymorphonuclear leucocyte of the spinal fluid exudate. It grows artificially on media containing blood serum and spreads in a majority of cases by droplet infection invading the upper respiratory tract followed by a blood stream infection and by some special affinity it chooses to attack the meninges of the brain and cord. There are four different strains of the organism, differentiated serologically, which is the reason that any given case may or may not respond to any given serum. Most of the commercial houses today are making the antitoxin from organism collected from various parts of the country hoping to get a product which is equally effective and will give results in any case.

The prevalence of the disease is greatest in the crowded districts especially the cities and industrial communities such as mining camps. The course of the disease is as stated (1) a local upper respiratory infection, (2) a septicemia followed, (3) a re-localizing of the infection in the meninges. The symptoms are those of a toxemia plus intracranial pressure. The course of the infection may be very acute or it may extend over a period of months. The relative prevalence of the meningococcic meningitis can be understood by noting the vital statistics of Kentucky for 1930. In the state there were 346 deaths or a rate of 13.2 per 100,000 population. From diphtheria there were 240 deaths or a rate of

9.1 while from influenza there were 802 deaths or a rate of 30.6 per 100,000. During my four years in general practice the records show that I have had 16 cases of meningitis, 14 being due to the meningococcus, one to the tubercle bacillus and one to the diphtheria organism.

In the meningococcic group of 14 cases, 6 completely recovered with no complications whatever. Of the 8 deaths, 4 had no treatment, this being due to death before treatment was available or a hesitancy to co-operate. Two of the other cases seemed to respond to treatment at first only to relapse later, while the other two cases gave no response to treatment whatever. All cases with purpura died in a very short time. Evidently the purpura was due to a very severe toxemia. The number of intra spinal treatments varied from 1 to 5, the amount of antitoxin used at each injection being 15 c. c. Osler states that it is rare to have more than one case in a home. Four of these cases occurred in one home. The greatest number of the cases that were saved were given early and repeated injections.

The length of time of these cases varied from 7 hours to 120 days, thus showing the great variance in the length of the course. From the records of a hospital in Philadelphia one physician reports 50 cases of chronic meningococcic meningitis with the conclusion that the chronic cases were by no means rare and that in any case of chronic brain infection a careful search should be made for the organism and if unable to identify same then the anti-meningococcic antitoxin should be given as it is the only hope for recovery. It is one of this chronic type of case that I wish to report.

L. H., girl, age 7, was first seen June 10, 1930, at the home in a stuporous sleep from which she could be easily aroused. The parents stated that she had taken sick February 10, with a cold followed by a slight convulsion. The convulsion had soon ceased only to recur at intervals, and at times she was almost in a normal condition. Several physicians had seen the case giving various diagnoses mostly referable to the gastro-intestinal tract. The parents stated that she had slept much more than usual, had no tendency to play, was very irritable, and had lost much weight. There was also frequent attacks of vomiting. Examination showed, temperature, 98.4. Pulse 84, Respiration, 16. The skin was pale and the body showed much loss of weight. There was slight amount of internal strabismus of the left eye which the parents stated had been present for only a few days. The neck was slightly stiffened and the Kernig's sign was suggestive. Feeling sure that there was some intracranial

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

pressure I asked that the patient be removed to the hospital for further examination. The patient was admitted to the hospital the next morning and at that time the temperature was 99.8, pulse, 100. The neck stiffness had slightly increased. The blood count showed W. B. C. 10400, polymorphonuclear leucocytes 86, lymphocytes, 12, and basophiles, 2. The hemoglobin was 80. The urine, fecal and the remainder of the examination was negative. A spinal puncture was done showing the fluid under increased pressure with a definite increase in the rate of flow when pressure was exerted on the jugular veins. The fluid was hazy in appearance and on standing over night no feathery film appeared. Smear from a centrifuged specimen revealed the presence of a gram negative intracellular diplococci. This was confirmed by a culture. The patient showed immediate improvement after the puncture and after receiving two injections of anti-meningococcic serum made a prompt and complete recovery.

From the above my conclusions would be (1) the most toxic cases are very acute, the toxemia being demonstrated by a purpuric rash. Also that the long standing cases develop some immunity thus making them a less dangerous type. (2) That the meningitis may vary in its course from a very acute to a fairly chronic disease. (3) That should the case not be improving it would be wise to use a different antitoxin. (4) That many of the chronic cases of meningitis that are looked upon as tubercular are really meningococcic in type and that treatment may give a good response. At least in all cases when the infecting organism cannot be identified it is a good idea to give the advantage of the anti-meningococcic antitoxin.

**Diffusibility of Calcium in Bronchial Asthma and Allied Disorders and in Pulmonary Tuberculosis.**—Studies made by Canarow appear to indicate that in bronchial asthma and allied disorders there is a definite and quite constant disturbance of calcium balance in the form of an increase in the ratio of diffusible to nondiffusible calcium. It is conceivable that this observation is related in some way to the increased capillary and cellular permeability which is believed to exist in these conditions. In chronic pulmonary tuberculosis there is considerable variation in the diffusibility of calcium. It seems that an increased diffusibility ratio is associated with an exudative type of lesion with a high degree of clinical activity, while a decreased diffusibility ratio is associated with a productive process, relatively benign clinically.

## BENIGN, HYDATED OR VESICULAR MOLE\*

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Somerset.

Mrs. S., age 35, wife of farm tenant, married 12 years, mother of five children—oldest 10 years, youngest (twins) three years—all normal deliveries, all living, no miscarriages. Tubercular history—negative. Specific history—negative. General appearance, poor, emaciated, sallow, anemic. Weight about 90 pounds.

History of feeling badly in January, 1931, about one month after last menstruation. Menses had been irregular for several years. She was suffering occasionally with nausea and vomiting, appetite poor and she soon became unable to do her usual household duties. During January she began having a blood-stained vaginal discharge, at times very profuse and at other times scant or none. She suffered little or no pain in abdomen or pelvis at this time. During February she noticed a slight enlargement above the pubes. The nausea and vomiting continued and with the absence of the menstrual periods she considered herself pregnant. The mass in lower abdomen increased rapidly during the last three weeks prior to entering hospital and had doubled in size within last three days. She came to the hospital on March 8, about three months after last menstruation. At this time the abdomen had attained the size of a seven months pregnancy. She appeared very uncomfortable and weak, suffering dyspnea and some evidence of shock—pulse 122, weak and thready—resp. 30—temp. 98 4/5. She complained of tenderness over abdomen but no definite pain. Examination of heart revealed a fast, weak heart action but no organic change.

Examination of abdomen revealed a large mass filling the abdomen up to three inches above the umbilicus, resembling a seven months pregnancy in size, shape, and contour. On palpation the mass felt of a boggy or doughy nature, instead of the normal elastic feel of the pregnant uterus. We were unable to determine the presence of a foetus.

Examination by vagina and abdomen revealed relaxed vaginal walls. The bulging mass filled the pelvic canal. The cervix was firm, the external os patent, admitting the tip of the examining finger, internal os was closed. No vaginal discharge was present at this examination. The cervix was rather long and gave the impression of a small uterus, which we later found to be flexed at

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.



right angle with the body of the uterus and pressed downward by the super-imposed doughy mass. At this examination we were unable to determine the existence of a pregnancy, neither could we ascertain if the tubes or ovaries were responsible for this mass.

After examination by some four or five other doctors a diagnosis was attempted. Three conditions were considered. First, a possibility of a ruptured tubal pregnancy. Second, an extra-uterine pregnancy. Third, an ovarian cyst.

The consensus of opinion seemed to favor a ruptured tubal pregnancy. An exploration was elected. A median incision was made, the hand was passed around the mass which was soon found to be the uterus filled with some soft, doughy content. We were still unable to ascertain any evidence of pregnancy. The wound was closed. We decided to empty the uterus by vagina. The cervix was dilated and we were met with a gush of blood-stained fluid, which soon changed to masses of grape-like vesicles (or a better descriptive term would be like frog eggs) which poured out easily by a little pressure on the fundus. At first we felt fearful of hemorrhage and administered one-half c. c. pituitrin. Fortunately there was very little loss of blood. We gently assisted emptying the uterus with placenta forceps. The last tissue to come away had the appearance of placenta tissue and was attached well up into the fundus. A dull curet was passed over the uterine walls to make sure all surface was cleared of debris. The uterine cavity was dried with gauze and swabbed with iodine then packed with iodoform gauze. The amount of tissue expelled from the uterus measured one and one-half gallon, with an estimated weight of twelve or fourteen pounds. The temperature rose to 101 and pulse to 130 within first twenty-four hours. Temperature returned to normal at the end of 48 hours. The pulse returned to 90 by the fifth day. She returned to her home on the 12th day and made an uneventful recovery.

#### SUMMARY

The cause of hydatid or vesicular mole formation is unknown. It is a disease initiated in the earliest stages of the growth of the ovum, and it is rare to be able to discover any trace of a foetal rudiment.

That the disease has a foetal origin is evidenced by the fact that it sometimes occurs in twins and one ovum is affected. In the absence of an intra-uterine examination, the diagnosis can only be made with certainty if any vesicles are expelled. It is so very rare for this to happen that a diagnosis has, as a rule, to be arrived at in some other way.

Owing to the abnormal size of the uterus

sometimes present in these cases, vesicular mole frequently has to be diagnosed from hemorrhage associated with pregnancy of a more advanced duration.

In vesicular mole there is (with the rare exception of twins or of the disease only affecting a small portion of placenta after the third month) no sign of foetus.

Accidental separation of placenta may be simulated by vesicular mole with bleeding into the uterus. The patient may then have the most marked symptoms and signs of internal hemorrhage, with only a blood-stained discharge or no discharge at all.

The diagnosis may be very difficult but in vesicular mole all signs of the foetus are absent, whereas, in accidental hemorrhage the presenting part will be felt.

Vesicular mole might be mistaken for placenta previa, when there is hemorrhage, and an examination discloses a soft mass in the region of the cervix. Such an examination, however, would at once bring away some of the vesicles which would settle the diagnosis. In addition there would be no signs of a foetus.

#### LUNG ABSCESSSES\*

L. WALLACE FRANK, M. D., F. A. C. S.

Louisville.

The subject of lung abscesses is interesting to the section of ear, eye, nose and throat of the Kentucky State Medical Association, to the surgeon, to the general practitioner, and to the roentgenologist. In other words, it is of interest to practically every one in the practice of medicine, except possibly the orthopedic men. The surgical literature on lung abscesses in the last five years has increased immensely and I don't think there is any doubt but that the incidence of the disease is becoming greater. Pinchon and Morelock of England attribute this greater frequency of lung abscesses, first, to the increase in the amount of surgery that is done around the mouth; namely tonsillectomy, and also to the appearance of the influenza epidemics of 1918 and 1927 with their streptococcic infections.

As to the etiology of lung abscesses, Flick and Clerf, of Jackson's Clinic, studied some 127 cases, and found that 82 of them followed operations around the mouth and throat, of which number 72 were tonsillectomies. Of these 72, five were done under local anesthesia and sixty-seven general anesthesia. Clerf, in a further study of 77 cases following tonsillectomy, found that four were operated upon under local anesthesia and 73 under general anesthesia. Our experience

\*Read before the Eye, Ear, Nose and Throat Section of the Kentucky State Medical Association at Lexington, September 7, 1931.

does not reveal so great a per cent of the lung abscess following operations around the mouth. In our own series, while not large, we have approximately 45 to 48 per cent occurring after nose and throat operations, including extraction of teeth. This agrees with the figures of Pinchon and Morelock, which show about 34 per cent, and I think it is probably a little nearer the truth than the higher figures given by Clerf, and is more in the line with the figure given by Moore, of the Mayo Clinic, who in the last five years has had 140 cases of which approximately 40 per cent followed tonsillectomy.

Twenty-five per cent of lung abscesses are due to pulmonary infections, such as pneumonia or influenza. Some abscesses are due to bronchial obstructions, some from new growths; and others are due to aspirated foreign bodies. Of the pulmonary suppurations which I intend to discuss, I am excluding those due to tumors, abscesses associated with tuberculosis and also the bronchiectatic.

There is a great controversy as to the route by which the infection gets into the lung whether per orum or by the blood stream. In going over a recent article by Kline and Berger of Cleveland, I will quote the following:

"The clinical and experimental evidence for embolism is well presented in the excellent communications of Cutler, Schlueter, Weidlein and Holman and of Fetteroff and Fox. This evidence as presented in a recent communication by Schlueter and Weidlein is as follows:

Our belief that postoperative lung abscess results from embolism, a mechanism produced by the dislodgement of an infected thrombus from the vessels of the operative area, is based on the following facts:

1. The definitely proved existence of the condition of fatal post-operative pulmonary embolism. This supposes the possible scattering from any wound of single or multiple emboli into the venous circulation.

2. The frequent development of lung abscess after operations performed in infected or potentially infected fields. In this class we refer particularly to nose and throat operations, especially tonsillectomy, and to operations performed on the gastro-intestinal tract.

3. The high percentage of occurrences after operations performed in mobile operative areas. Thrombi are easily dislodged from such regions as the pharynx and epigastrium. In operations on the brain in which the skull acts as a splint the percentage of post-operative pulmonary complications is almost nil.

4. The not uncommon appearance after operations in which local anesthesia is employed.

5. The failure to prevent post-operative pulmonary complications with the constantly improved methods of giving inhalation anesthesia.

6. The greater frequency of lower lobe involvement. This is explained by the greater volume of blood and the more direct course of the pulmonary artery to these lobes.

7. The often symptom-free period following the operation before the onset of the complication. If the aspiration mechanism were the causative factor, the appearance of the symptom would be early.

8. The sudden pain in the chest that frequently constitutes the initial symptom and the often severe and stormy associated clinical course that often follows before rupture and evacuation occur.

9. The acknowledgement by bronchoscopists that typical lung abscess is rare with the lodgment of foreign bodies even deep in the air passages.

10. The unsuccessful attempts at experimental production in animals by the introduction of infected materials by way of the air passages, either by transtracheal implantation or by aspiration.

11. The comparative ease with which lung abscess can be produced by the intravenous injection of infected materials."

Although pulmonary abscess was produced in dogs by the intravenous injection of a large embolus containing staphylococci, pneumococci and colon bacilli, the process eventuated in healing and not in a progressively enlarging lesion. That such a progressive lesion was not produced is probably due more to the organisms employed than to the route. The experimental abscesses reported by these investigators are similar to the embolic pulmonary abscesses observed clinically in cases of septicemia and pyemia. In cases of this type in man observed at autopsy, the abscesses were invariably multiple, involving several lobes and varying in diameter from several millimeters to about 1.5 cm. In one case they were confluent in places. The gross lesions were grayish or reddish gray without appreciable odor. Many were just below the pleura, and this structure was frequently involved. Microscopic examination of sections stained by the Gram method showed clusters of staphylococci first within the lumen of a blood vessel, then within the walls, the lumen at this time usually containing a thrombus. Apparently following the inflammatory process in the walls of the vessel there was a spread of the staphylococci and of the suppurative process into the regional lung tissue.

Although of interest in connection with the evolution of embolic abscess already described, the experiments of Cutler and his associates in our opinion do not throw any



light on the pathogenesis of the so-called typical lung abscess of man. The following facts are more convincing evidence that in these cases the organisms reach the lung by aspiration:

1. The frequent occurrence of aspiration of foreign material is borne out by the finding at autopsy of deposits of coal pigment in the lungs of adults.

2. Pneumonia undoubtedly following the aspiration of food particles and bacteria during the unconsciousness or coma or of anesthesia is an occasional autopsy observation. On microscopic examination, sections from these cases show the foreign material and bacteria in the bronchial branches and in the alveoli, surrounded by inflammatory exudate.

3. It was reported by Myerson that bronchoscopic observations immediately following tonsillectomy under general anesthesia showed the presence of blood and mucus in the bronchial tree in 155 of 200 cases. Myerson concluded that the failure of evacuation of infected material is the most important factor in the causation of pulmonary abscess. Among the reasons given for this failure are the loss of action of the cilia, the lessened elasticity and compressibility of the lung and a local immobility. Furthermore, it has been shown experimentally that rabbits receiving considerable numbers of pneumococci in the trachea just beyond the larynx get rid of them without suffering appreciable involvement of the lungs, whereas in those animals in which the same number of similar organisms has been introduced into the air sacs an inflammatory process invariably develops.

4. The production of pneumonia by intrabronchial inoculation of pneumococci in dogs by Meltzer and Lamar, in rabbits by Winteritz and Hirschfelder, and by intratracheal inoculations in monkeys by Cecil and Bløke, proved that aspiration can explain the manner in which organisms reach the lung in man.

5. There is evidence for the belief that the various inflammatory lesions of the lung may be brought about by the aspiration of the causative bacteria from the mouth during the deep sleep following fatigue. In much the same way ether anesthesia increases the opportunity for aspiration into the lung and at the same time renders the body incapable of expelling the foreign material.

6. The occurrence of severe pulmonary inflammation containing innumerable bacteria following clean operations in clean fields on patients under general anesthesia indicates that in these cases the bacteria are undoubtedly aspirated from the oral cavity. Likewise, in clean cases done under local anesthesia, the bacteria most certainly reach

the lung by aspiration and not by embolism.

7. An anatomic study, including examination of Gram and Warthin-Starry stained sections of early lesions of pulmonary abscess and of pulmonary gangrene, reveals that the process in these cases is one of inflammation starting in and about small bronchial branches. This is quickly followed, however, by changes characteristic of gangrene when staphylococci or other pyogenic organisms predominate in the lesion, and more slowly by changes characteristic of gangrene when spirochetes, fusiform bacilli, and vibrios of the oral type predominate. The spirochetes are present not only in the area of necrosis but also at the advancing periphery.

8. The experimental production in a rabbit of pulmonary gangrene by the intrabronchial injection of material from a carious tooth containing innumerable spirochetes and fusiform bacilli is proof that aspiration of these organisms may produce pulmonary gangrene. This experiment is confirmed by those of Smith, who reported the production of experimental aspiratory abscesses in mice, guinea pigs and rabbits by the intratracheal inoculation of material from about the teeth of patients with moderately severe pyorrhea, containing spirochetes, fusiform bacilli and vibrios. More recently Crowe and Scarff, and Allen report the production of lung abscess in dogs by the intrabronchial inoculation of material containing oral spirochetes.

Schluter and Weidlein state that in a census of recent writers 40 declare themselves in favor of aspiration while only 10 favor embolism as the direct cause of lung abscess. From the available evidence, the view of the majority is apparently the correct one.

If it is true that the organisms producing pulmonary abscess and pulmonary gangrene are aspirated from the oral cavity (and in a larger series studied recently it is found that in 22 per cent they find spirochetes in practically all of them) the reduction of trauma by the surgeon in the operative cases as advocated by Cutler will do less to prevent these conditions than proper oral hygienic and therapeutic measures. Such a program of preoperative oral care is now being followed at Mount Sinai Hospital at Cleveland."

As to the symptoms of pulmonary abscess: in those following tonsillectomy, there is a period of quiescence of approximately 5 to 10 days, followed then by pain in the chest first, chill, fever and later the expectoration of foul smelling sputum. Pulmonary abscess must be differentiated from empyema, especially interlobar empyema, and also from partial bronchial obstruction due to growth which may have been present and not suspected until the added irritation of the anesthetic started the process anew. By a careful

study of the history, thorough physical examination of the chest together with well made and properly read stereoscopic x-ray picture a diagnosis of lung abscess can be made.

Here I think is the time that the bronchoscopist should be called in consultation. We know that there are a certain number of lung abscesses that are due to aspirated foreign material. There are some individuals as cited in a recent article by Jones, which came out in the *Military Review*, who have symptoms of lung abscess following tonsil operations yet when studied by the bronchoscopist the symptoms are found to be due to bronchial obstruction from malignancy, the cough of which is due to suppuration below the obstruction. In such cases the important feature is not the abscess but the malignant process.

Having made a diagnosis of lung abscess what are you going to do with it? In the untreated cases the mortality runs 75 to 80 per cent. Lord states that 10 per cent will get well spontaneously, and Graham, of St. Louis, puts the percentage a little higher than 10. With mortalities of such dimensions one must get busy with the treatment right away and the earlier it is instituted the better the results, not only so far as the permanency of the cure and rapidity with which it is obtained is concerned, but the fact that the individual is relieved of the systemic effect of long continued suppuration, and those other changes that we see, such as the changes in the joints, the changes which may occur in the kidneys and liver and hence it behooves us to eradicate the pathology early.

Of course, it goes without saying that in any suppurative process, especially in any pulmonary process that rest in bed, sunshine and proper diet are the essentials. The next most important thing I believe is postural drainage. To cure an abscess we must have three conditions present. In the first place we have to establish drainage, so that with the evacuation of the pus the fibrous wall can fall together. If the pus is evacuated the ordinary elasticity of the lung, together with the distension of healthy lung tissue as a result of breathing will compress the abscess and bring the walls together, (if they are not too rigid) this allowing the cavity to be obliterated. Postural drainage should be instituted early and continued, but in addition I think all these cases should be treated by the bronchoscopist. Clarf and Flick et al. of Jackson's Clinic report 54 per cent of cures by bronchoscopy alone. Marsh out of 105 cases reports 51 cases cured and 18 cases improved by bronchoscopy alone. It is true that in the abscesses located in the periphery of the lung the bronchoscopist can do very

little, but in those located deeper, toward the center part of that organ not only can aspiration of the pus be accomplished by the bronchoscopist but he can dilate the stricture of the bronchus resulting from the surrounding inflammatory process. Also he can remove the excess granulation tissue which obstruct the bronchus and keep the cavity from evacuating itself. So evacuation of the abscess may be accomplished either by suction or by postural drainage.

There are a certain number of cases that in the end will have to go to the surgeon. In the Mayo Clinic it runs about 25 per cent. In Jackson's Clinic it runs 28 per cent and one of the English clinics it runs 35 per cent. Such cases must seek surgical intervention whereby external drainage is instituted.

I do not wish to discuss the technique of external drainage, except to say that it should be a multiple stage operation, and that the mere introduction of a tube into the abscess cavity will not produce a cure in the majority of cases. The cavity should be opened widely so that your wound of entrance into it is of the same diameter as the cavity. If the drainage wound is smaller then the cavity will not fill in properly and the result will be a bronchial fistula. If there is a wide opening into the abscess the wound can be packed with gauze and granulation will occur and fill in the cavity with less likelihood of bronchial fistula.

Those cases where the abscess is located in the lower part of the lung and where access from the outside is somewhat difficult may be treated by phrenicectomy. Such treatment should only be instituted where the cavity is in communication with a large bronchus so that the pus can be evacuated; otherwise instead of evacuating the pus and allowing the patient to get well the use of the diaphragm may obstruct the drainage canal and thereby make the condition worse.

Some cases must be treated by thoracoplasty, with collapse of the chest and these are the most serious cases, requiring the closest co-operation between surgeon, internist and roentgenologist.

As I said in the beginning we are seeing more lung abscesses than formerly and therefore I wished to bring before this section our experience so that earlier recognition and early treatment may be instituted at a time when the result of such treatment may be a cure rather than an amelioration of a few symptoms.

#### DISCUSSION

G. C. Hall, Louisville: Mr. Chairman and Gentlemen: I think we should thank Dr. Frank for coming here and presenting this subject to us, because it is a matter of the utmost importance. The most significant feature is the fact that these cases affect young adults; that is,



people in the very prime of life. Clerf, in 77 cases, states that 65 per cent occurred between 20 and 40 years of age. Flick in 172 cases found that 58.7 per cent of the cases occurred between the ages of 20 and 40 years, and that means a serious impairment of people in what ought to be the most productive part of their life.

It is true that most of these cases followed tonsillectomy in young adults, and that the great bulk of these cases followed general anesthesia. That argues, I am sure, for more probable origin of the cases in aspiration. I feel that there are some cases unquestionably due to embolism and that both methods of causation should be considered.

It is significant I think that in the experimental work along the production of pulmonary abscesses in animals that the injection, that is the introduction in the air passages of material containing spirochetes, have been the most prolific in the production of these abscesses. That would call our attention to the fact that we should be more particular in selecting cases for operation, to see that they haven't latent Vincent infection in the mouth.

Regarding the treatment, the cases that I have seen unfortunately have been late cases, and my experience has not been as favorable in the treatment of these cases by bronchoscopy as the figures that we get from the Philadelphia clinic. Clerf states in 77 cases 38 were entirely well, 7 were improved, 6 were unimproved, 18 were referred to the surgeon, 3 died and 5 were under treatment when the report was made.

I have had only 7 or 8 of these cases and I have treated them all by bronchoscopy. All of the cases that I saw were late cases. Some of them were people very old and those cases did badly. In the cases that I have seen in children bronchoscopy has certainly improved them all, but after a period of improvement some of them have gone back.

I know one case that Dr. Frank operated on for me, which showed the temporary effect of bronchoscopic drainage and the very brilliant results that you may get from external surgery of the lung. This boy had gone down after a period of improvement and it was pitiful, but after Dr. Frank had done a two-stage operation and drained the lung this boy came back. After several months' treatment Dr. Frank said he was going to send him over to see me. The kid came over one day and I didn't recognize him, because when I had seen him the last time he was literally a bag of skin and bones, and when he came over to see me after this external operation was done he was fat and healthy looking to the point where, as I said, I didn't recognize him at all.

I do think that bronchoscopic drainage should be instituted early and the earlier it is instituted the more benefit you can expect, though in Jackson's Clinic the last time I was there I

saw a man put on the table for bronchoscopic drainage who was big and husky looking at the time, and he told me, I think it was, the sixty-fifth or sixty-eighth bronchoscopic drainage he had undergone. He was about well, so that even the late cases can be benefited by bronchoscopy.

The cases that I have seen having been late cases, as I said, makes me less enthusiastic about the therapeutic value of bronchoscopy than I would be had I seen most of the cases in the early stages, but I do believe it offers a prospect of cure in some cases and should be tried before external drainage is resorted to. Certainly, however, there is distinct place for the surgeon and for external operations on these cases and sometimes it is the only thing that will give relief.

**M. C. Baker, Louisville:** I have decided since hearing this paper to be more careful than ever with my tonsil work. I am very much surprised to learn that such a high percentage of lung abscesses has followed surgery about the mouth, nose and throat. I did not realize that the percentage was so high. I have always held to the opinion that most lung abscesses came through the blood stream, but the proof seems to be in the paper that this percentage is that high.

When I was in the army, in Massachusetts, the Doctor associated with me was from Salem, Massachusetts. He would give his patients ether and sit them up in the chair and do his tonsil cases that way, in the upright position—give the anesthetic on the table and sit the patient up in the chair and do the tonsillectomy. That seems to be the favorite way of doing it in the East. So far as I know he had no complications, but it did not seem surgical to me, and it looks to me like a patient would be more liable to have lung abscesses from that particular type of surgery than the other.

I endeavor to have my patients come to the operating table with a free intestinal tract and well prepared ahead of time, and I am rather particular in my after-care of these patients. I have been doing tonsillectomies around 15 or 16 years, and so far as I know I have never had a lung abscess or pneumonia following tonsillectomy. I suppose I have just been very lucky in that regard, but since hearing this paper I am determined more than ever that these patients shall have particular care ahead of time, and go to the table especially with a clean mouth and throat.

**Claude T. Wolfe, Louisville:** Dr. Frank has given us another one of his interesting dissertations.

My interest in the subject deals with its prevention. In this I wish to state that I have no specific but I do believe that if certain precautions are followed in throat surgery the number of lung abscesses can be lessened.

As to whether the infection gains entrance into the lung through the veins, lymphatics or

the tracheo-bronchial route is not of particular importance, but I personally believe that the latter route is the more logical, and with that in mind I employ measures in the removal of tonsils that I personally believe prevent lung abscesses.

If tonsils are to be removed under a general anesthetic I feel sure that an anesthetist should be chosen who is thoroughly competent and one who is familiar with our method of operation. The choice of anesthesia is gas, oxygen and ether. Occasionally ethylene has been used with very gratifying results. Only sufficient anesthesia is used to permit the removal of the tonsils without undue amount of traumatism. This point should always be borne in mind.

The suction apparatus is indispensable at time of operation. All secretions, including blood, are promptly removed and the possibility of inspiration is greatly minimized. This apparatus with special attachment is also used upon several occasions preceding the operation. This is done to rid the tonsils of food debris and other infection, and in a way surely eliminates to some extent the possibility of aspirating this material.

Following the operation the patient is returned to his room with a dry throat, placed in a prone position face downward and to one side and over the end of a pillow. In this position and secretion of blood coming into the throat immediately drips out of the mouth.

If the tonsils are removed under a local anesthetic the point to be borne in mind is the dispatch of the operation within the limits of safety. To accomplish this the patient's confidence must have been gained and the usual apprehension must have been eliminated. This latter condition is readily done away with by the administration of nembutal the night before and the morning of the operation. These methods are mentioned to emphasize the necessity of getting the patient in the best operable condition so that as little traumatism to the parts will be done. This will eliminate bleeding to a great extent and hasten the convalescence of the patient and minimize the possibility of infection getting into the lung. The question has been asked if nembutal makes a patient dizzy.

They do occasionally complain of slight dizziness but I have never attached any significance to this symptom. In my hands nembutal has been very gratifying and has supplanted morphine and scopolamine.

**J. D. Williams, Ashland:** I have been doing tonsillectomies for about twenty years and during that time I have had one lung abscess. That was a most interesting case. The child was being anesthetized. Suddenly I looked down and I saw that the patient's mouth was full of ether. I immediately stood him on his head for about a minute. He had a lung abscess but got well.

I think Dr. Wolfe is entirely correct. He has

exactly expressed my ideas. As to suction, in addition to keeping the throat as free of mucous as possible during primary anesthesia, it is particularly indicated to remove the debris which invariably is expressed when the ecraseur is closed on the tonsil pedicle. This to make unlikely inspiration pneumonia and the arthritis that follows tonsillectomies due to contact of such debris with the raw tonsil bed. I immediately pause, use my suction, then go ahead with the operation. I also have the patient in a position with the head below the level of the rest of the body.

**S. B. Marks, Lexington:** I have seen two cases of lung abscesses since I have been doing this work. The first one was a boy of 18, whose symptoms dated back to the time he had measles three or four years previously. I did a number of bronchoscopies on him: dilated his sinus into his abscess, used suction and injected argyrol into it. I think it was after about the fifth aspiration that he coughed up the vertebra of a bird. He said that he had had measles in the fall and his friends were very nice to him and sent him a lot of birds to eat. That was just a simple vertebra and soon after that he cleared up.

The other was a boy 16 years old. He belonged to the Crippled Children's Commission. I did the tonsils under general anesthetic. He developed lung abscess about the fifth day, and was practically well in three weeks by postural drainage.

Too much emphasis cannot be laid upon the suggestion made by the gentlemen in their discussions as to the care during operations and prior to operations. I think careful suction with plenty of assistance to give you careful suction is most valuable. I also like to let the head of the table down about 6 or 8 inches from the horizontal. It sometimes makes it a little more inconvenient, but I believe it is well worth while. It helps you keep the larynx clean and I hope it keeps some of the blood from getting into the trachea.

**Wallace Frank, (in closing):** I think the points that have been brought out by the various speakers are excellent, especially that of doing everything possible to prevent lung infection.

I was rather astounded in looking up the figures of the incidence of lung abscess to find how many cases occurred between the ages of 20 and 40, namely 59 to 61 per cent. The age between 20 to 40 is the time of life when the individual certainly should be at the peak of his physical condition, and that, as a rule, is the time that the use of local anesthetic may be preferred. Children are operated usually under general anesthesia, and yet we see most lung abscesses coming at this later age and most of them coming after general anesthetic. I think the explanation of this frequency of lung abscesses in the prime of life lies probably in



the fact that infection about the teeth are most common then.

The question comes up, how soon should the bronchoscopist be called. I think as soon as the diagnosis of pulmonary abscess is made. If at the end of three months the patient isn't making satisfactory progress under proper regime the surgeon should be called to consider the advisability of external drainage.

In some cases where spirochetes are present fair results have been obtained with arsphenamin in the hands of some men, and these claim that the dose should be rather large and given rather frequently. In the hands of other individuals arsphenamin has had but little effect in the curing of these conditions. At the present time emetin is being used rather widely and I think with some degree of success.

Again I want to thank you gentlemen for the privilege of being here this afternoon.

### BLADDER ATONY—SPHINCTER VESICAE RELAXATION. AN EFFICIENT REMEDY AND MEASURE OF PREVENTION IN MAN

SUGGESTIONS FOR EXERCISE OF THE BLADDER WALL AND THE SPHINCTER FIBRES

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Louisville.

A trite old saying has a man as old as his blood vessels and a woman as old as she looks or feels, or both. With equal propriety, it may be stated a man is no younger than his bladder. On this account, the noted surgeon and teacher, David Yandell, was wont to say to his students: "No man shall call me old while I am able to make a good stream."

Loss of muscle tone in the male bladder with relaxation of the sphincter vesicae is a condition, developing in some men earlier than others. In this brief paper, etiology of the distressing state will not be attempted. Suffice it to say, the vexatious manifestation likely asserts itself with most men as years roll on, even though there has been no infection in the genito-urinary tract.

Men are greatly inconvenienced by the dribbling and consequent soiling of their clothes. Relaxation of the bladder wall and loss of tone in the sphincter fibres is wholly the cause, referred to at this time, for which treatment is suggested.

Any simple means, which will postpone the appearance of this age accompaniment is worth while employing, before there develops residual urine, with its train of symptoms and signs, often evidencing serious disturbance of an all-important part of man's

anatomy.

So far as I am aware, the plan about to be suggested is not in common use; the writer thinks it had its origin with him. He has recommended its employment, not only to many patients, but has suggested it to colleagues, some of whom have tried it on themselves, as well as having advised it for others. Gratifying results have been reported.

As in the application of any remedial agent, benefit is to be expected where fixed organic pathology does not already exist. In proportion as the plan is put to use early and better, where recourse is had to it before evidence of faulty tone is apparent, the best results are seen. The plan is applicable to any man, without chance of harm. It proposes,

### EXERCISING OF THE BLADDER WALL AND THE SPHINCTER FIBRES.

What is the plan? How may it be applied?

All of us have observed a tendency on the part of boys to empty the bladder by grasping the penis and holding it tightly. They then make pressure against the urethra near its distal extremity. Bladder contents are forcibly expelled by exerting voluntary muscular contraction in addition to the action of the involuntary fibres of the viscus. In contradistinction, the average man of 35 or more, with penis but lightly held in the grasp of the fingers, (often not held at all), permits urine, in a desultory fashion, to find its outlet as best it may. Thus, such men afford no voluntary assistance in the important function of vacating their bladder.

Some thirty years ago, it occurred to the writer that what the bladder needed and what the sphincter fibres required was daily, frequent exercise. The writer reasoned that better muscle tone would result by this exercise and that a more complete functioning and emptying of the reservoir and of the long canal would follow.

Accordingly, he began to inquire of men as to the strength, tone, and the dependability of the bladder. It was soon apparent to him that, at about age 50—in some cases, considerably earlier, and in others, later—dribbling was a frequent man's trouble. Some men complained of a few drops that appeared after the act had been completed and following the replacing of the organ. Others complained of loss of several drops, sometimes of an actual spurt of urine, (as if the bladder were overfilled), before they could reach the urinal. Some lost a quantity of urine, immediately they felt inclination to void: others soiled underwear or bed linen, whenever exertion was made. Suddenly rising from the sitting position or the recumbent posture would at times cause leakage—even moving

in bed from one side to the other was occasionally responsible for soiling.

What an embarrassing, troublesome and distressing thing is a leaky bladder! Ask the next patient. He may tell you that he would give all but his birth right to be relieved.

For all of these poor fellows, the remedy, herein outlined, may be tried with reasonable expectation of benefit. Its application is easy; it costs nothing; persistent perseverance is, however, necessary.

Advise the patient to undertake to re-establish bladder tone as follows:

Cease to empty the bladder like a lazy old man; grasp the penis firmly; make pressure at the meatus, forcibly expel contents by exerting voluntary muscular effort. This should be done in short expulsive efforts. Improvement may at first appear slow. In a majority of instances material benefit, if not complete relief will result.

Thus bladder efficiency may be maintained where function is still good or the sufferer will possibly succeed in restoring a healthier tone and will postpone the arrival of the nightmare of advancing years, DRIBBLING, the result of

"Bladder Atony and Sphincter Vesical Relaxation."

### WHOOPIING COUGH WITH UNUSUALLY HIGH LEUKOCYTOSES\*

W. W. NICHOLSON, M. D.

Louisville.

My reason for reporting this case is twofold: first, it is relatively rare for the blood count in whooping cough to exceed 80,000, and, second, white counts exceeding 100,000 may represent extraordinary leukocytoses, and should not be confused with acute leukemia.

Seits reviewed the literature in 1925 and could find only eight cases of whooping cough reported that exceeded 100,000 leukocytes, and at that time reported two cases one with a count of 192,000 per cubic centimeter which died and no autopsy done; the other, a boy eight months of age, with a count of 162,000 which made an uneventful recovery.

#### ADMISSION NOTE

Colored baby, two years of age, admitted to Baby Ward Colored with provisional diagnosis of acute nutritional disturbance.

Present Illness: Three weeks before admission to the hospital baby had whooping cough and was apparently doing very well until August 12, when he had convulsions several times during the day, and eight or ten

loose stools, with a high temperature and hacking cough. Day before admission (August 13) temperature continued high and had seven convulsions during the day, but stools were not as frequent.

Previous History: Full term baby, weighing seven pounds, normal delivery on September 7, 1927. No convulsions, cyanosis or hemorrhages. Breast fed until five months, at which time baby was put on cow's formula. Fed regularly every three hours. Cod liver oil drams 1, t i d. Orange juice daily. Cooked cereals began at six months with green vegetables at eight.

Previous Illness: Chicken pox at 5 months. Complete recovery. Pneumonia March, 1928 with complete recovery. October, 1929, pneumonia; very severe infection and child did not eat well or gain weight satisfactorily. Three weeks before admission patient developed whooping cough and did very well until two days before entering hospital.

Family History: Essentially negative, except one half-brother in tuberculosis sanatorium. Patient has never been in contact with him.

#### PHYSICAL EXAMINATION

Patient is a fairly well developed and fairly well nourished negro child two years of age, who appears acutely ill with difficulty in breathing and has expiratory grunt. On disturbance of the child there is a rather distressing cough, not, however, typical of whooping cough. Skin is rather dry also the mucous membranes pale. Hair is long and curly and scalp is rather dirty. No cranial tabes. Fontanelles closed. Conjunctivae clear but pale. Pupils react to light. No obstruction in nasal passages. Ear drums are negative. Tongue is coated slightly with red edges. Tonsils are large and injected. No exudate. Cervical glands are palpable but not noticeably enlarged. No enlargement of axillary glands or inguinal. Temperature 102. Pulse 140. Resp. 45. Respiration is rapid and rather difficult. Abdominal in type. Breath sounds are rather harsh over all areas of lungs, with few rales but no abnormal impairment. Pulse rapid. Heart sounds distinct. No murmurs, shocks or thrills. Slight distention of abdomen. The liver is two fingers below the costal margin. Spleen not palpable. No abnormal masses felt. Reflexes normal. Extremities negative.

The blood count the day after admission (August 15, 1929) was R B C 5,520,000; W B C 181,000; 12% Polys; 88% Lymphs, Hb 70%. A check count was made and the white count was 170,000. Blood platelets 300,000. The next day (the 18th) the white count was 190,000, with 11% Polys and 89% Lymphs. Daily counts were made and the highest count was on the 23rd, 198,400. At this date the temperature was at its peak,

\*Read before the Jefferson County Medical Society October 5, 1931.



104½ degrees, and the patient was very ill. The cough was severe and characteristic cough spasms. For several days the prognosis was very bad. On August 31 the blood count had dropped to 106,000 and the temperature to 101. Baby was much improved and the differential count showed 48% Polys and 52% Lymphs. From this day on the patient improved and the count dropped simultaneously with the temperature. On September 17, the white count was 18,000 and baby was discharged in good condition. Returned to the clinic on several occasions with diagnosis of whooping cough and broncho-pneumonia and in February, 1930 the count was down to 8,000 whites.

#### DISCUSSION

**Morris Flexner:** Several years ago when I was an interne, I happened to have a case of pertussis broncho-pneumonia which had 85,000 leucocytes; that was by all odds the greatest number I had ever seen in whooping cough; the interesting thing in that particular case to me, was the smear. You could see repeatedly throughout the smear the lymphocytes apparently dividing by fusion. I never saw this before. You would see the lymphocytes which would have two nuclei with a strand of nuclear material between, and, then you would see also lymphocytes with two distinct nuclei in them. This is the only condition I have ever seen that in.

I wonder whether this particular case showed that or not? I thought 85,000 was a pretty good leucocytosis, but this one makes it seem not unusual.

**W. W. Nicholson,** (in closing): It was not noticed that the characteristics of the lymphocytes were as the ones Doctor Flexner described, but all the lymphocytes were rather small, very few large ones.

**Radiotherapy in Cancer of Uterus.**—In his general review on the subject, Donaldson states that in cases which were recognized in time and in which treatment was begun immediately, the patients remained completely cured. In the more advanced cases one obtains a remarkable temporary improvement. The patients gain in weight and state that they never felt so healthy. But at the end of one and sometimes of two years they become pale, look toxic and complain frequently of swelling of the lower extremities. On examination the cervix and the vagina appear healthy, but deep in the pelvis one can feel a neoplasm, which ulcerates finally into the rectum, the bladder or the vagina and the patient dies from cachexia. The actual problem at present is to find means for preventing metastases in the lymph nodes and the deep structures of the pelvis.

#### THROMBOSIS OF THE FEMORAL ARTERY\*

E. S. ALLEN, M. D.

Louisville.

Every surgeon has had the unfortunate experience of post operative thrombo phlebitis. About the 10th or 12th postoperative day, as the patient is planning to leave the hospital, a low grade pyrexia develops. The patient does not feel as well as the day before. There is some discomfort in the pelvis, a pain in the leg, perhaps several days later the limb is swollen, the temperature is then accounted for. The patient is depressed realizing that hospitalization will be indefinitely prolonged. Though unexpressed, there is frequently the feeling that the surgeon is in some way responsible for this complication.

Gynecological operations are followed by thrombosis more frequently than any other type of surgery. In Hampton's and Wharton's report on a large number of cases operated on at Johns Hopkins Hospital, 81% followed abdominal operations. In this series of 21,000 cases one thrombo phlebitis developed in 1%. Lindsey in a large number of operations, 31,426 found that 1.1% developed thrombo phlebitis, with a mortality of 3%. The femoral vessels were involved in 50% of cases and the left femoral more frequently than the right.

The causative factor in this unwelcome complication is thought to be surgical trauma and infection.

Thrombosis of arteries is a much more rare post operative complication. In my experience I have seen but two cases. In each the femoral artery was involved. The left in one and right in the other. This report includes post operative thrombosis and not arterial occlusion and thrombosis where a diseased artery exists, as in endoarteritis obliterans.

**Treatment:** If the clot can be located, the vessel may be opened by a longitudinal incision. The clot withdrawn and vessel sutured. If clot reforms, it is feasible to implant the artery into the femoral vein, preferably below the saphenous opening. This was done successfully by Wieten of Constantinople.

J. B. Murphy exposed the femoral artery just below pampiniform ligament in an obstruction of the common iliac artery and with delicate forceps, a bifurcated clot was removed from below upwards, coming from the femoral and profunda. Blood followed showing that there was some collateral circulation. Forceps and irrigation and the inser-

tion of a catheter 7 1-2 inches in the proximal part of artery brought only dark blood clots and debris. After passing catheters and probes 19 inches into the artery, suddenly a gush of bright red blood swept the vessel clean.

H. Matti, operated on a man 70 with sudden embolism of the femoral artery. No pulse could be felt below pourparts ligament. He opened the artery and removed embolic plugs above and below, although 12 hours had elapsed, the circulation was restored except in two toes.

#### REPORT OF CASES

Case 1. Mrs. B. age 35, was operated on July, 1920 to repair a perineal tear of the third degree. Her general condition was satisfactory for surgical procedure. Heart and lungs negative, urinalysis negative. blood count 4,500,000 red and 8,700 white cells, coagulation time 4 1-2 minutes. Examination revealed the abdominal cavity and pelvis negative for any pathology. The perineum had been torn into the rectum. She had little or no control of defecation. Under gas oxygen ether anesthesia, the sphincter ani muscle and perineum were repaired. The post operative convalescence was uneventful until the 5th day, when an intense pain developed suddenly in her left leg and groin requiring frequent hypodermics of morphine. I was out of town and did not see this patient for 36 hours. She at this time was completely exhausted, pulse 140, temperature 97, and thoroughly narcotized. The limb was blanched, cold from pourparts ligament to toes. Amputation was considered, but she was such a poor operative risk for amputation that palliative and restorative measures were resorted to; such as heat, and hypodermoclysis. I regret to state that opening the artery under local anesthesia was not considered. This patient died 24 hours later.

Case 2. Mrs. H., age 60, referred by Dr. Holmes, of Carrollton, for an acute gall bladder. She was fairly well nourished and gave a history of numerous gall bladder attacks, dating back ten years. Physical examination revealed a rather large heart, with a definite mitral murmur, poor compensation, and she had decided arrhythmia, and a history of frequent heart attacks. The family physician had spent the entire day with her just a week before she came to the hospital treating her in one of these heart attacks. There was decided atheromatous arterial changes. Temperature 100, pulse 90 to 100. Blood count 12,000, 80% polys. Urinalysis, trace of albumen, hyalin and granular casts, an occasional pus cell, trace of bile, no acetone, nor diacetic acid.

On examination the gall bladder could be palpated and was very sensitive to pressure. It was decided that local anesthesia would be

the safer anesthetic.

Nembutal one hour before operation and morph. gr. 1/6, 1/2 hour before were used as preliminaries. A subcostal incision was made under novocain infiltration anesthesia. A large distended gall bladder was encountered, with a large stone obstructing the cystic duct. The common duct was free from stones. The gall bladder was drained of a clear fluid and stone removed. The gall bladder was not removed on account of inflammatory thickening, extending down to cystic duct and traction on gall bladder caused enough pain, that a general anaesthetic would have been necessary to do a cholecystectomy. A tube was inserted in gall bladder and abdomen closed. This patient had a very smooth convalescence until her 10th day. About 9 p. m. the nurse reported that the patient was suffering intensely with her right leg, screaming with pain. I ordered a hypodermic of morphine and went at once to the hospital. The patient had gotten no relief from the morphine. An examination revealed the right leg blanched to within 2 or 3 inches of pourparts ligament. The line of demarcation was clear cut. There was no pulsation in the femoral artery. Deep palpation of the abdomen revealed pulsation in the external iliac. She was taken to operating room as soon as it could be prepared and under Novocain anesthesia a 3 inch incision was made over femoral artery, exposing it. It was collapsed, there was no bleeding. Dissecting up to pourparts ligament. The point of thrombosis was easily visible; in fact the obstruction could be both felt and seen. While inserting my left fore finger under the obstructed part and about to incise the artery. I felt the thrombus displaced and at once the artery below began to pulsate. Almost immediately the patient stated that her leg felt better. Hyperemia could be observed rapidly extending down the leg. I watched to see where the clot would lodge, but the entire leg and foot became hyperaemic, except circular area of the heel about one inch in diameter. The patient obtained complete relief, several small vessels had to be clamped and ligated after the clot was dislodged. The following morning the heel presented a slight cyanotic appearance and it was a question as to whether a terminal branch of the post tibial artery was thrombosed or a hot water bottle burn.

The patient made an uneventful recovery. A follow up history last week, records that she had quite a bit of trouble with her heel. The family physician had opened an abscess three weeks after she had returned home. This would lead one to conclude that a terminal artery in the heel had been obstructed



## HEALTH, ITS VALUE TO YOU AS AN INVESTMENT\*

J. GARLAND SHERRILL, M. D.

Louisville.

The fallacy is prevalent that men are born equal, when such is not the case. To bring into being a healthy, vigorous child is the great privilege of parentage. For such result to obtain, a clean healthy life is necessary upon each side.

The greatest asset to a child, therefore, is vigorous health. It should be guarded carefully throughout life. If kept at its highest point all other things will follow. Good health is the foundation of success in every line of endeavor; it is the basis of all happiness, and makes life a joy. Beginning, therefore, in infancy the careful preservation of health is the most important thing for consideration.

Good health is a necessity. It is desirable and should be acquired and maintained if possible.

Good health is a responsibility, first of the parent, second of the individual, and third of the community.

The proper instruction of children upon health matters is the duty of the parent and the teacher. The individual is responsible to himself and to the community for proper care of his health. Dental and general body hygiene, proper living and good habits are essential to a full life.

The community is responsible to the individual for the right to live in the enjoyment of peace and happiness. Sanitary conditions in schools, good water supply, proper protection of life and property is the duty of the community to its people. Health instruction, protection against infectious and contagious disease, as well as the necessary research in preventive medicine is also a public responsibility. The line between public and individual responsibility should be carefully drawn to prevent the tendency to paternalism in government and the loss of individual initiative.

Health is an expense. In order to continue in good health, both as an individual and as a community, certain expenditure is necessary. To the individual it means proper housing, good food, suitable clothing and the ordinary expenses of living. The most valuable and yet least expensive investment for health is a competent and trustworthy medical advisor. The usual budget allows less for health expense than any other purpose.

Good health is an expense to the community, yet it is the most valuable investment that can possibly be made. The return in production, as a result of a healthy community, cannot be overestimated. Certainly this

costs in money, time, and thought, because the means of preventing disease is expensive. Municipal water supply, sewerage and plumbing cost money. Isolation hospitals are a constant drain on the public purse. Efficient milk and food inspection cannot be had for nothing. Good milk costs more than poor milk. Health departments are asking for more money all the time. School inspection and the fight against tuberculosis goes on at considerable expense, yet it saves the lives of the little ones. The guardians of the municipal treasury often have to refuse to meet these urgent demands because of lack of funds.

With all these expenses it can be readily determined that good health is an economy. I can state without fear of contradiction that health is the cheapest commodity that can be purchased. In truth it is not purchasable and is beyond price; when lost, it cannot be retrieved. Short of this it can be saved by good medical care.

The efforts to restore it are also expensive but well worth while. The excellent hospital and medical service afforded our people is, I fear, not appreciated. There is much talk of high cost of medical and hospital service. Much of this criticism is unjust and ridiculous.

Most people appreciate the wonderful advantage of good medical, surgical, and hospital care. Unfortunately many persons either do not appreciate such service or fail to give any evidence of it to those who serve.

The saving in time alone to a patient who receives loving, kind, gentle, and skillful service is most valuable if computed in dollars and cents only.

Hospital service has been so much improved in this country within the last two decades that a great reduction in mortality has resulted. In addition a great saving in hospitalization has occurred. The net result is a great saving from the return of the patient to productive work. This is particularly true of the accident cases.

The many new appliances and hospital equipment necessary to the best services are expensive. Hospitals can barely exist on the income derived from their patients, and often show a deficit even under the best management.

The actual expense of hospital service including food, nursing, laboratory and other technical service is less than that of a first class hotel. The talk, therefore, about high cost of this service is unjust. If the community will support its hospitals, its nurses and its physicians properly, the investment will be returned many fold in good health.

\*Radio Speech Over WLAP, Louisville.

## INTERSTITIAL NEPHRITIS\*

PHILIP F. BARBOUR, M. D.

Louisville.

I wish to report a case of interstitial nephritis with autopsy on the kidneys presenting some interesting features.

A girl, C. A., aged 11 years, weight 74 pounds, normal height was seen for severe anemia. Examination of the blood showed Haem. 45, RBC 2,920,000, WBC 7,000. Routine examination of the kidneys brought out the fact that she had passed great quantities of urine for some months. A diagnosis of diabetes mellitus had been made by several physicians but no sugar had been found in the urine at that time or at subsequent times. The examination of the urine showed a two plus albumen and only an occasional hyaline cast. It was reported that she had had albumen four years previously. The presence of albumen rules out diabetes insipidus as the cause of the polyuria. The heart and lungs and gastro-intestinal tract were apparently normal. There was no history of any illness of any kind whatsoever with the exception of influenza at the age of 5 months during the severe flu epidemic of 1918. The tonsils had been removed 4 years previously but there was no apparent benefit from the operation. The child appeared to have very little pep, was somewhat backward in her school work and handled herself somewhat clumsily. On account of the large amount of albumen she was put on a low protein diet and was given a prescription of organic iron. There was a slow and steady increase in the hemoglobin and red blood cells. The general symptoms improved and the weight increased up to 86½ pounds.

The child appeared rather sluggish and was below the average grade in school. The history revealed the fact that she was slow in learning to walk and talk. The possibility of cretinism as a factor had to be considered. The metabolic rate was found to be plus 31 and plus 18 on a subsequent test. The features were coarsened and the hair dry and coarse but not sparse. The fingers and toes were long and pointed. The fact that she had never taken any thyroid treatment and that her metabolic rate was plus 18 apparently ruled out cretinism and confirmed the opinion that some other chronic illness would explain the mental slowness.

After this time the amount of urine began to decrease and she suddenly developed an eclamptic seizure. Examination of the blood at this time, April 17, showed urea nitrogen 75. The urine showed serum albumin two plus and quite a number of pus cells but there were no casts. From this time on the

child steadily lost strength and passed away in July from uremic convulsions.

An autopsy on the kidneys showed their weight to be 31 and 28 grams respectively. This is the weight of the average normal kidney at six months of age. It is interesting to note that this over weight girl of 11 years of age had managed to live the usual life of a child of her age with infantile nephritis and those kidneys damaged. It is an example of the factor of safety in the kidneys and that they can do much more than their normal function. Secondly there was no available history to indicate why interstitial nephritis should have occurred. There was no history of the usual diseases from which interstitial nephritis develops. The fact that the kidneys failed to develop from six months, at which time she had had the attack of influenza, inclines one to connect the two. Physically she was able to do what other children could but the central nervous system was not quite able to stand the strain. Thirdly, it is interesting to theorize on the possibility of the filtration and absorption theory of the newer biochemistry. In this case the pathological study showed no tubular epithelium at all. It would be difficult to determine that the specimen is that of a kidney and yet this child was able to get over the threshold the nitrogenous products so that there was no retention until the last few weeks.

Thanks are due to Dr. Winter for the post-mortem and to Dr. Weeter for the pathological study of the kidneys. Dr. Weeter's final report on the microscopical examination was chronic interstitial nephritis.

## DISCUSSION

**Irvin Abell** One of the most interesting features about Dr. Barbour's case report is the extremely small amount of kidney tissue found at the autopsy. This would indicate that the life of the child had been sustained by an amount of renal tissue much less than that found in healthy normal children of corresponding age.

This finding has been borne out by research work of different investigators. Dr. Judd in discussing the symposium on renal diseases at the recent meeting of the State Society, stated that Mann of the Mayo Clinic had found that one half of one kidney was sufficient to support life in the laboratory animal and further that there was a marked regeneration of kidney tissue after such removal. The older members of the Society will recall the several visits to our city of Dr. Martin Fischer of Cincinnati. Many years ago Dr. Fischer reported before one of our meetings his experience in determining the amount of renal tissue needed to support life. He had removed the half of one kidney, still later the remaining half, and still later one-half of the second kidney from a fox terrier

\*Read before the Jefferson County Medical Society



bitch. While in Cincinnati several years later I had occasion to visit the Medical School and paid a visit to Dr. Fischer's laboratory. I inquired of him the ultimate result in this particular dog; she was still living and had borne the third litter of pups since her renal tissue had been reduced to one-fourth of its normal amount; she was still in good physical condition.

**H. M. Weeter:** In presenting the kidney of Dr. Barbour's case, wish to state that the microscopical section showed the changes to be those of a chronic interstitial type.

### BOOK REVIEW

**SURGICAL PATHOLOGY OF THE SKIN, FASCIA, MUSCLES, TENDONS, BLOOD AND LYMPH VESSELS.** By Arthur E. Hertzler, M. D., Surgeon of the Agnes Hertzler Memorial Hospital, Halstead, Kansas. Professor of Surgery, University of Kansas. 260 illustration. J. B. Lippincott Company, Publishers, Philadelphia. Price \$5.00.

The purpose of this book is to present the result of observations in the clinic or the operating room with only incidental discussions of the findings of the laboratory. The various skin lesions are studied and discussed from their very incipency, and as the author aptly states, their proper treatment requires as much skill as removing a goiter. In the illustration the photograph of the patient with the visible growth is shown with the microphotograph of the section. This volume will prove to be a very great adjunct to the surgeon and the physician.

**SURGICAL PATHOLOGY OF DISEASES OF BONES.** By Arthur E. Hertzler, M. D. Surgeon to the Agnes Hertzler Memorial Hospital, Halstead Kansas, Professor of Surgery, University of Kansas. J. B. Lippincott Company, Publishers. Price \$5.00.

This book is the result of 30 years of medical teaching and the writer has included what he has deemed essential to meet the needs of the medical student and the young surgeon and the story is told as much as possible with illustrations with the complete legend appended. The subject matter is discussed under three heads: first Pathogenesis, which includes the development of the disease and is the link between the pathology and the purely clinical. Pathology: which includes the physical findings and gross pathology. History: This section includes just enough of the finer anatomy to make gross pathology intelligible.

**TABLES OF FOOD VALUES.** By Alice V. Bradley, B. S., Supervisor and Instructor of Nutrition and Health Education, State Teachers College, Santa Barbara, California. Manual Arts Press, Publishers, Peoria, Illinois. Price \$2.00.

Doctors doing metabolic work will find this book helpful. It is the outgrowth of the demand for tables which will facilitate the calculation of diets by giving a complete classification of foods, such as cereals, fruits, vegetables, etc., and showing their respective values in the diet, as far as present-day scientific information permits. All the essential data needed for calculating the nutritive value of a given food are found in one table. This is the first time that this information has been presented within the confines of a single volume.

**PRACTICAL MASSAGE AND CORRECTIVE EXERCISES WITH APPLIED ANATOMY.**—By Hartvig Nissen, Late President of Posse Normal School of Gymnastics; Superintendent of Hospital Clinics in Massage and Medical Gymnastics; For Twenty-four years Lecturer and Instructor of Massage and Swedish Gymnastics at Harvard University Summer School; Late Director of Physical Training at Boston and Brookline Public Schools; Former Instructor of Physical Training at Johns Hopkins University and Wellesley College. Former Director of the Swedish Health Institute, Washington, D. C., etc.

Fifth Edition, Revised and Enlarged by Harry Nissen, President, Posse-Nissen School of Physical Education, Boston, Mass. Illustrated with 72 original halftone and line engravings. F. A. Davis Company, Publishers.

This little book has been used as a text book at the Posse-Nissen School of Physical Education for the past twelve years.

Three major subjects are discussed at length First: The different manipulations and their effects.

Second: Applied anatomy and corrective exercises with various lists of exercises.

Third: Treatment of various diseases and injuries, including a discussion of flat feet.

The writer has for several years been teaching massage in the Harvard University Summer School.

**SIMPLE LESSONS IN HUMAN ANATOMY.**—By B. C. H. Harvey, M. D., Professor of Anatomy, University of Chicago. Price \$2.00. American Medical Association, Chicago, Ill.

No greater aid can be given to the practitioner who has been out of college a number of years, than this book just published by the A. M. A. It is short, concise, amply illustrated printed in good large type on heavy smooth paper, suitable in size for a reference book, and is considered one of the best popular treatises on anatomy that is available. It is a pleasure to recommend this volume to the medical student, general practitioner and the busy surgeon.

# Kentucky Medical Journal

Published Monthly By

THE KENTUCKY MEDICAL ASSOCIATION  
IncorporatedEntered as second class matter October 22, 1906, at  
the Postoffice at Bowling Green, Ky., under act of  
Congress, March 3, 1879.Subscription Price .....\$5.00  
Edited Under Supervision of the CouncilOFFICERS OF THE KENTUCKY STATE MEDICAL  
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NEXT MEETING LOUISVILLE

## COUNTY SOCIETY REPORTS

**Jefferson:** The February program of the Jefferson County Medical Society will be as follows:

### February 1st

Special Meeting for Consideration of Public Health Problems.

### February 15th—Addresses

1. Treatment of Delayed Union in Fractures and of Ununited Fractures, William Sneed, M. D., Surgical Department of Cornell University, New York City.

2. Treatment of Brain Abscess, James J. King, M. D., Neurosurgical Department of Bellevue Hospital, New York City.

GUY AUD, President,

ULY H. SMITH, Secretary.

**Bourbon:** The Bourbon County Medical Society held its annual meeting on Thursday evening, December 17th, 1931 at 8:00 p. m. The Society met in the County Court House, Paris, Kentucky.

The following were present: Drs. J. A. Orr, C. G. Daugherty, J. S. Willingford, William Kenney, G. C. Rankin, H. M. Boxley, J. C. Hart, L. Oerendorfer, and M. J. Stern.

Visitors: Drs. Howard Stitt and C. E. Wooding, Cincinnati, Ohio. Drs. John Scott, Edward Murray, J. S. Chambers, Carey Barrett, S. S. Parks, Charles A. Vance, Lexington; Drs. Wyles, Blount and Wood, Cynthiana; Drs. B. N. Pittenger, J. C. Comer and W. B. Hopkins, Paris.

Dr. Hopkins was elected a member of the Society. Dr. Blemker's name was presented to the Society and referred to the Board of Censors.

### Election of Officers:

J. C. Hart, President, Paris.

William Kenney, Vice-President.

H. M. Boxley, Second Vice-President, Millersburg.

M. J. Stern, Secretary-Treasurer, Lexington.

C. G. Daugherty, re-elected censor, (retiring member).

Daugherty, Delegate.

Stern, Alternate.

C. E. Wooding read a paper on Bronchial Lavage from the Medical Aspect; showing numerous x-ray films and giving some case histories.

Howard Stitt read a paper on Bronchial Lavage, and showing moving pictures.

The discussion was opened by Dr. John Scott, Lexington, followed by Drs. Daugherty and Stern and closed by Drs. Stitt and Wooding.

M. J. STERN, Secretary.

**Clay:** Clay County Medical Society met in Drs. Anderson and Ricketts office at 10 o'clock A. M. The following members were present: Drs. J. L. Anderson, A. C. Foster, P. J. Keith, C. T. Ricketts and G. P. Webb.



The president being absent,, Dr. J. L. Anderson, the secretary, called the meeting to order.

1. The status of the profession was discussed in a general way including the financial conditions and collections.

2. The Frontier Nursing system as practiced in Clay and adjoining counties was considered at some length which resulted in the following resolution:

"Resolved that the Clay County Medical Association appeal to the State Board of Health for protection against the practice of medicine by nurses in Clay County and if not so protected to appeal to the civil courts."

It is generally believed by the members of the society that the State Board should take some steps for their protection and see that illegal practices by nurses same as other individuals should be stopped. This situation was thoroughly brought out by Dr. J. L. Anderson at the state meeting all of which is in the December number of the Journal to which the State Board is referred.

It is ordered that a copy of this be sent Dr. A. T. McCormack to be taken up by the State Board of Health at its next meeting.

J. L. ANDERSON, Secretary.

**Franklin:** The usual meeting of the Franklin County Medical Society was held in the Writing Room of the Capital Hotel, Thursday, December 3rd, 1931 at 12 o'clock noon.

The President called the meeting to order and the minutes of the last meeting were read and adopted. Members present were: Drs. Ginn, Darnell, Jackson, Coleman, Lyon, Hollie, Travis, Patterson, Coblin, Demaree and Youmans. The usual business of the meeting was entered into at once.

The officers elected for 1932 are as follows: President, Dr. George H. Heilman; Vice-President, Dr. M. C. Darnell; Secretary-Treasurer, Dr. C. E. Youman, Frankfort. Delegate, Dr. F. M. Travis; Alternate-Delegate, Dr. A. M. Lyon. Censors: Dr. L. T. Minish, 3 years; Dr. John Patterson, 2 years; Dr. C. T. Coleman, 1 year.

The Society was honored with the presence of Drs. W. E. Gardner and James W. Bruce of Louisville. Dr. Bruce gave a most interesting talk on "Diphtheria" with special reference to diagnosis and treatment. This subject was freely discussed by most members present. The Society adjourned to the Hotel Dining Room for lunch.

C. E. YOUMANS, Secretary.

**McCracken:** A fine meeting of the McCracken County Medical Society was held December 16th, 1931 at which time a new set of officers was elected to serve the society in 1932.

President, Bob Overby; Vice-President, Palmer H. Reed; Secretary, Leon Higdon; Treasurer, E. W. Jackson; Delegate, H. G. Reynolds to succeed himself; Censor, Harry D. Abell.

W. T. Dowdall presented an excellent paper, his subject being "Diagnosis of Duodenal Ulcer."

Our society has enjoyed a splendid year, notwithstanding the "repression."

John Ewing Dunn of Paducah, a new member, was admitted to membership. We now have forty-seven members, a fine spirit prevails.

J. T. REDDICK.

**Grant:** The Grant County Medical Society met at the office of the Health Department on Wednesday, December 16, 1931 with the following members present: Drs. Abernathy, Blaine, Price, Marshall, Mann, O'Hara, Ellis, C. M. Eckler and C. A. Eckler.

The meeting was called to order with the President, J. W. Abernathy, in the chair.

The minutes of the last meeting was read and approved.

Report of Clinical cases was called for and very interesting reports including sudden deaths in infants, unusual cases of Urticaria, unusual Cancers, X-ray pictures, were all well discussed from all view points.

The subject for the evening, "Blood Pressure," was now opened by a Round-Table discussion and introduced by J. L. Price of Sherman. Dr. Price showed that he had made a study of Blood Pressure for a long long time. He showed how necessary it was to detect this symptom early and recommended the Sphygmomanometer be used the same as our fever thermometer. He emphasized particularly the Diastolic Pressure as the important one. He made a most excellent talk. Dr. Marshall of Crittenden, was the next to discuss this subject and reported numerous and interesting cases in his own practice. Dr. Marshall stressed the importance to find the cause before doctoring the blood pressure or else we might do the patient great harm. He also discussed the different forms of treatment, and showed a thorough study of the subject.

Dr. O'Hara also made quite a good talk on this subject showing that Blood Pressure cuts quite a figure in your examinations for life insurance, pensions, etc. He showed clearly how different diseases caused different aspects of pressure. He stressed the importance of the Diastolic pressure as it being more certain than the Systolic. He went into the mechanism of Blood Pressure forcibly and clearly.

The subject was enjoyed by all present and each felt that it was good for him to have been there.

New business was now taken up and Election of Officers for 1932 called for, and motion and second was made and carried unanimously to elect all the same officers for another year. So the officers for another year are as follows:

Dr. J. W. Abernathy, Williamstown, President  
Dr. A. D. Blaine, Dry Ridge, Vice-President.  
Dr. C. A. Eckler, Dry Ridge, Sec. and Treas.

Dr. C. M. Eckler, Williamstown, Delegate to State Meeting.

Dr. H. F. Mann, Crittenden, Alternate to State Meeting.

Dues collected for 1932: Dr. Mann, \$5.00; Dr. Marshall, \$5.00; Dr. Price, \$5.00; Dr. N. H. Ellis, \$5.00; and Dr. C. A. Eckler, \$5.00. Total \$25.00.

Topic for next meeting: "Every Day Obstetrics."

There being nothing further to discuss, we adjourned to meet the third Wednesday in January.

C. A. ECKLER, Secretary.

**Licking Valley Medical Society:** The Bracken County Medical Society was host for the Licking Valley Medical Society at the fourth quarterly meeting for the year, on Thursday, December 10th.

Dr. W. B. Moore, of Cynthiana, was elected president for 1932 and Dr. C. W. Shaw, of Alexandria, was re-elected Secretary. Dr. J. H. Caldwell, of Campbell County Society gave a very interesting and instructive case report. Dr. Wm. R. Miner, Covington, read a paper on "Pyelitis," and Dr. Robert L. Biltz read a paper "Pneumonia in Children." After a liberal discussion of these papers, dinner was served to the members and their wives and friends in the High School Building.

The following physicians were present: J. M. Blades, Butler; W. R. Miner, Covington; R. L. Biltz, Newport; E. W. Northcutt, Covington; Terry Bird, Covington; J. D. Northcutt, Covington; L. C. Hafer, Covington; C. N. Heisel, Covington; Jas. A. Ryan, Covington; C. W. Shaw, Alexandria; O. W. Brown, Foster; W. B. Moore, Cynthiana; M. McDowell, Cynthiana; W. G. Phillipss, Maysville; A. R. Quigley, Maysville; D. S. Bonar, Newport; J. A. Caldwell, Southgate; B. K. Menefee, Covington; O. E. Senour, Erlanger; C. A. Morris, Covington; N. A. Jett, Covington; J. H. Caldwell, Newport; J. E. Dawson, Covington; H. C. White, Covington; C. A. Menefee, Covington; N. D. Colvin, Germantown; and the following Bracken County members: C. H. Wallin, J. C. Norris, F. L. Peddicord, J. J. Carroll, E. J. Yelton, W. B. Wallin, B. F. Workman, C. F. Haley and J. M. Stevenson.

It was decided to hold the March, 1932 meeting in Covington.

C. W. SHAW, Secretary.

**Licking Valley:** The Licking Valley Medical Society met in Brooksville, December 12, for its quarterly meeting. W. B. Moore, Cynthiana, was elected President. Vice-Presidents, Hadley Caldwell, Newport; J. C. Norris, Bracken County; N. P. Ellis, Williamstown; Edward Nelson, Falmouth; Secretary-Treasurer, C. W. Shaw. About thirty-five physicians attended the meeting.

C. W. SHAW, Secretary.

## BOOK REVIEWS

**GENERAL BACTERIOLOGY.**—By Edwin O. Jordan, Ph. D., Professor of Bacteriology in the University of Chicago, and the Rush Medical College, Chicago, Ill. Tenth Edition, Entirely Reset. 819 pages with 200 illustrations. Philadelphia and London: W. B. Saunders Company, 1931. Cloth, \$6.00 net.

The new (10th) edition of Jordan's "Bacteriology" has been issued after one of the heaviest and most thorough revision this book has ever had. The revision necessitated a rewriting, and hence a resetting of the entire book, which has been increased by the new matter to the extent of 40 pages.

The heaviest revision has been given perhaps to the sections on variations, undulant fever, paratyphoid group, filtrable virus diseases, pathologic yeasts, and anaerobes. The bacteriophage problem has been treated in greater detail. The question of nomenclature has been dealt with with the thought of convenience rather than the strict rules of taxonomy. Changes of less major character have been made throughout the entire book, bringing the work into accord with the very latest knowledge of the rapidly-changing subject of Bacteriology. It is one of the finest books in all bacteriologic literature.

**HANDBOOK OF ANATOMY.**—Being a complete compend of Anatomy. Including the Anatomy of the Viscera, a section on Surgical Anatomy, a chapter on Dental Anatomy, numerous tables and adopting the newer nomenclature designated the Basle Nomenclature, commonly called B. N. A. By James K. Young, M. D., F. A. C. S. Late Professor of Orthopedics, Graduate School of Medicine, University of Pennsylvania. Late Associate Professor of Orthopedic Surgery, University of Pennsylvania. Revised by George W. Miller, M. D., F. A. C. S., Associate in Anatomy, Jefferson Medical College, Surgeon to Montgomery Hospital, Norristown, Penn. Seventh Revised Edition, with 154 engravings, some in colors. F. A. Davis Company, Publishers Philadelphia.

This new seventh edition shows the popularity of the book, which was written to aid the new student in Anatomy. The author consistently uses the latinized form of the Basle Nomenclature in the text, plates and index. Where both the new and the old terms are used the new is emphasized by its primary position. The student fresh from his academic studies will find this book a great aid.



# KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. 30 No. 3

BOWLING GREEN, KY.,

MARCH, 1932

## EDITORIALS

### THE VERDICT OF EXPERIENCE

The vast majority of physicians in Kentucky do not need to be reminded that whole-time county health administration not only offers the one really effective means of protecting and promoting the public health, but also materially adds to their professional incomes. Experience and observation have long since combined to compel realization of this fact. To the scattered few who may still harbor the altogether mistaken idea that public health work injuriously affects private practice, we commend for their thoughtful consideration an item appearing in a recent issue of the weekly News Letter of the New York State Department of Health.

On October 29, 1931, states this item, approximately three years after the organization of the Suffolk County Department of Health, the following resolution was unanimously adopted by the Suffolk County Medical Society at the largest annual meeting in its history:

RESOLVED, That the Suffolk County Medical Society reaffirms its opinion, first expressed in 1926, that public health administration can only be efficiently done by county organization, (to replace township part-time organization); that after three years of experience the local profession more strongly than ever believes that the efficiency of public health practice is greatly improved by county organization; and that the physicians of the county have found that a County Health Department is an asset in their professional work and an asset to their economic welfare.

This is wholly in line with experience wherever the Full-Time County Health Unit has been in operation for any considerable period. Indeed, it would be altogether surprising if such were not the case. Second only to its essential value in prevention and control of communicable diseases is the importance of whole-time county public health administration in developing health consciousness on the part of the people—in educating the public to the need of timely and personal application of the knowledge which medical science has provided and is constantly augmenting for keeping the human body physically fit. The measure in which this educational procedure is made effective is

also and inevitably the measure in which private practitioners are sure to profit.

The public health administrator and the practicing physician are, in no sense, competitors. They are co-workers in the same field. Each has his own distinctive service to perform, but these two services are directed to a common end and are so intimately related that only by close, intelligent and whole-hearted co-operation on the part of both can full measure of success be attained by either. To this relationship the General Assembly of Kentucky, when it created the State Board of Health in 1878, gave practical recognition by placing responsibility for public health administration in the State squarely upon the shoulders of the Medical Profession. Not only has the wisdom of that course long since been vindicated, but is given greater emphasis, year by year, in decreased death and morbidity rates and in correspondingly increased productivity on the part of the citizenship.

### THE LOUISVILLE DIAGNOSTIC CANCER CLINIC

The inauguration of a Diagnostic Cancer Clinic in connection with the new Norton Memorial Infirmary, Louisville, marks a decided step forward in the efforts in Kentucky to bring under control a disease constituting a health problem of rapidly augmenting magnitude. This is the second clinic of its kind in the South. The first, the Steiner Clinic in Atlanta, has been in operation for several years.

The Cancer Clinic of the Norton Memorial is affiliated with the American Society for the Control of Cancer, which has the endorsement of the American College of Surgeons. It is for diagnosis only. No treatment is instituted. Its purpose is to provide adequate facilities, available without cost to all classes of the citizenship, for accurately diagnosing suspected cases sufficiently early to permit cure by scientific and logical treatment. While provision is made for studying advance cases, this study will be directed rather to suggesting methods for alleviation of suffering than to effecting a cure. The Staff of the Clinic, in addition to general physicians and surgeons, consists of specialists in the various lines of medical endeavor; while the physical equipment is up-to-date in every respect.

It is to be hoped that the not distant future will see the establishment of clinics of like character at various points in the State. Cancer in this country has been steadily on the increase for the last three decades, until it now ranks second only to heart disease as a cause of death. In Kentucky alone in 1929, 1574 people died of this disease; in 1930, one year later, the number jumped to 1863. Completed figures for 1931 have not yet been compiled, but the indications are that the compilation, when finished, will show an undiminished rate of increase.

Years of scientific research have so far failed to establish a specific cause of cancer. The consensus of opinion, however, among those who have given the subject special and careful study is that it originates as a local disease. If detected and properly treated in its early stages, cancer can, in the vast majority of instances, be cured. Unless removed or destroyed while still localized, the disease spreads to neighboring tissues, enters the blood vessels and so is carried to distant parts of the body. The chief reason for the steadily mounting curve in the fatal incidence of cancer lies in the fact that people afflicted with the disease are usually ignorant of or ignore the early signs until the malady has advanced to a stage where, in the present state of our knowledge, cure is impossible.

But limited as is the present knowledge of cancer, there can be small room for doubt that the knowledge we do possess would, if properly and generally applied, go a long way towards controlling the disease. To secure such application two things are essential: Realization on the part of the laity of the prime importance of consulting a physician upon the first appearance of any abnormal growth or condition, and recognition by physicians generally of their duty to be satisfied with no diagnosis as to whose accuracy they have any doubt possible of removal. The former is a matter of education; in effecting the latter, diagnostic clinics, with adequate physical equipment and expert personnel, have an indispensable part to play—a part which the average physician can not always properly perform because of lack of experience and necessary apparatus.

The JOURNAL welcomes the new Clinic, in the confident expectation that it will render invaluable aid in the fight to check the ravages of cancer. Its opening constitutes but the first step in meeting a very real need, not alone in Louisville, but in the State at large.

## SOUTHEASTERN SURGICAL CONGRESS

The third annual assembly of this convention will be held at the Tutwiler Hotel, Birmingham, Ala., March 7-8, 1932.

The secretary and local chairman of committee on arrangements, Dr. B. T. Beasley, will gladly send literature upon request regarding the speakers and subjects discussed. Kentucky will be represented on the program by Dr. Irvin Abell and among the other distinguished speakers are Dr. Chevalier Jackson, Philadelphia, Dr. Dean Lewis, Johns Hopkins, Dr. F. W. Ratkin, Mayo Clinic, and Dr. George W. Crile of Cleveland Clinic.

Kentucky physicians and surgeons are cordially invited to attend this congress, and are requested to notify the secretary so that arrangement can be made for their entertainment.

## OPHTHALMIC EXAMINATIONS

The American Board for Ophthalmic Examinations will hold an examination in New Orleans on Monday, May 9, 1932, at the time of the meeting of the American Medical Association.

Necessary applications for this examination can be procured from the Secretary, Dr. William H. Wilder, 122 South Michigan Avenue, Chicago, Illinois, and should be sent to him at least sixty days before the date of the examination.

## AMERICAN ASSOCIATION FOR THE STUDY OF GOITER

The American Association for the Study of Goiter again offers an award of Three Hundred Dollars (\$300.00 for the best essay based upon original research work on any phase of goiter presented at their annual Meeting in Hamilton, Ontario, Canada, June 14th, 15th and 16th, 1932. It is hoped this offer will stimulate valuable research work, especially in regard to the basic cause of goiter.

Competing manuscripts must be in English and in the hands of the Corresponding Secretary, J. R. Young, M. D., Rose Dispensary Bldg., Terre Haute, Ind., not later than March 15, 1932. Manuscripts arriving after this date will be held for the next year or returned at the author's request.

The first award of the 1931 Kansas City, Mo., meeting was given Dr. Bruce Webster, Presbyterian Hospital, New York City, "Studies in the Etiology and Nature of Simple Goiter as produced Experimentally in Rabbits."





### THE NEW JOHN M. NORTON MEMORIAL INFIRMARY

The new John M. Norton Memorial Infirmary was opened for the reception of patients on January 2. The hospital is composed of two units, the new building proper and a reconstructed portion of the old building. These two units are connected by enclosed passageways. The new building is of the Y shape construction, consisting of two wings for patients and one wing for operating rooms, laboratories, diet kitchens, x-ray rooms, obstetrical delivery rooms and dining rooms.

The first floor of the new hospital is devoted to the lobby, administrative offices, chapel, emergency admitting room, emergency surgery, doctors' coat room, library, and internes' quarters.

A resident doctor and four internes are at present provided for and it is anticipated that this service will later be augmented by the addition of another resident. The interne service is a rotating one.

The children's ward occupies a portion of the second floor; the remaining beds are used for medical and surgical patients. The dining room is located on this floor. Provisions are made for visitors and friends of patients

who may desire to obtain their meals in the hospital.

The third floor is devoted exclusively to obstetrical patients. Two modernly equipped delivery rooms, lying-in rooms and nursery are parts of this service.

The beds on the fourth and fifth floors are for the care of medical and surgical cases. On the fourth floor is located a modern x-ray laboratory. In this department, there are four separate x-ray units, one of them being connected with a room especially designed for the care of urological patients where cystoscopy and minor operative procedures may be carried out. The clinical, bacteriological, and serological laboratories are on this floor. The pathological department is also located on this floor with provision for rapid diagnosis by frozen sections. This makes the pathological department especially convenient to the operating rooms, which occupy the floor directly above.

There are four modernly equipped operating rooms. The entire operating suite is equipped with grounded floors and mercury are electrical connections which reduce the fire and explosion hazard to a minimum. Especially designed lights are afforded in each operating room. Compressed air and suction are also provided. One of these rooms





NURSES DINING ROOM

is especially equipped for neurological surgery. Spacious work rooms for nurses, modern sterilizing apparatus and large dressing room, with private lockers and shower baths for surgeons, are also located on this floor. A new feature of the operating suite is that the water is doubly distilled, thus

enabling the administration of intravenous medication with less risk of reactions and obviating the necessity of having solutions prepared outside by the pharmacist.

The entire new structure has rubber tile floors throughout. The halls and rooms are provided with sound proof ceilings so that the



FRONT VIEW



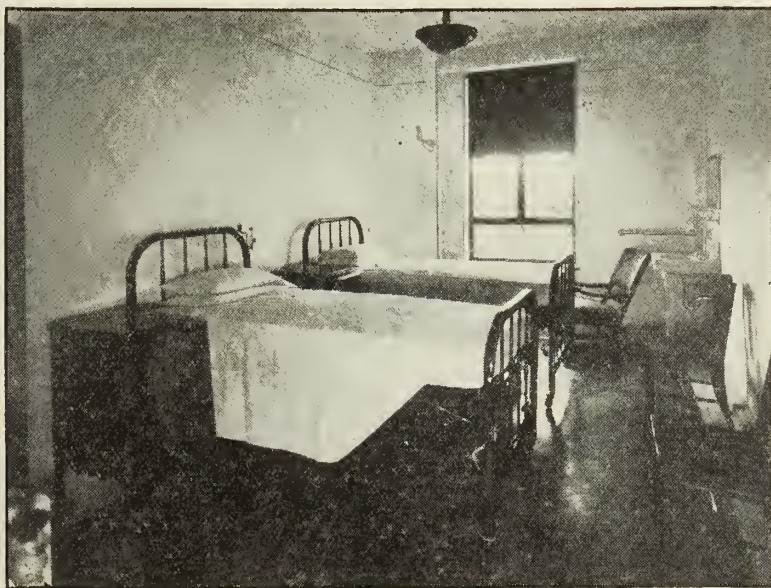


UTILITY ROOM

entire structure is unusually quiet and devoid of noise. A large waiting room is also provided for visitors on each floor.

Two rooms in the new structure are equipped with filtered air, thereby providing facilities for a more careful study of allergic patients, i. e. hay fever and asthma cases.

The north wing, a part of the old building, which was not demolished in the erection of the new building, has been entirely reconstructed, with running water in each room, circulating ice water, serving rooms, warmers, and all the special equipment found in the new building. The two upper floors are for



TWO-BED ROOM



BABIES BATH

the care of patients. Two large spacious wards are provided on each of these floors. The second floor is used for resident personnel. On the ground floor is located the morgue, adjoining which there has been built a large autopsy room. The professor of pathology at the University of Louisville is in charge of all pathological material. On this floor

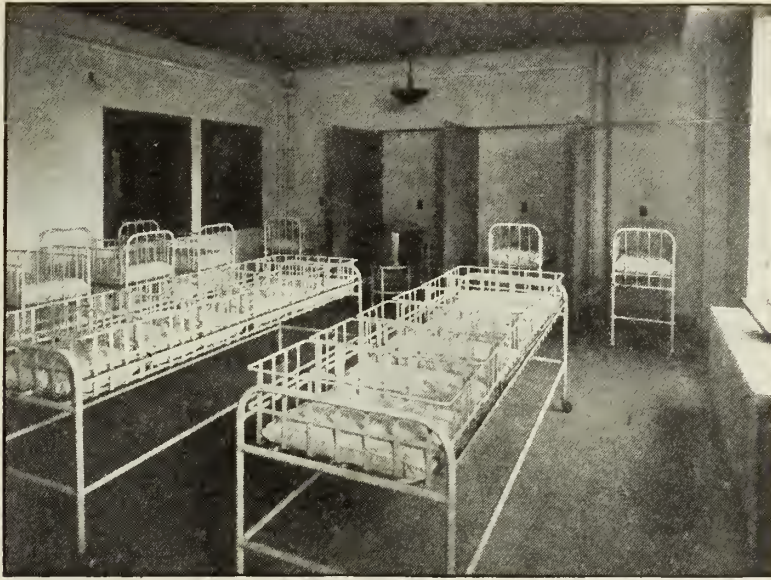
are also isolation rooms in which any communicable disease arising in the hospital may be cared for. The remainder of the floor is equipped for the out-patient department.

On entering this floor from the street, there is an apothecary which will serve the resident patients in the house and the out-patient clinic. This apothecary is in charge of a



CHILDRENS WARD



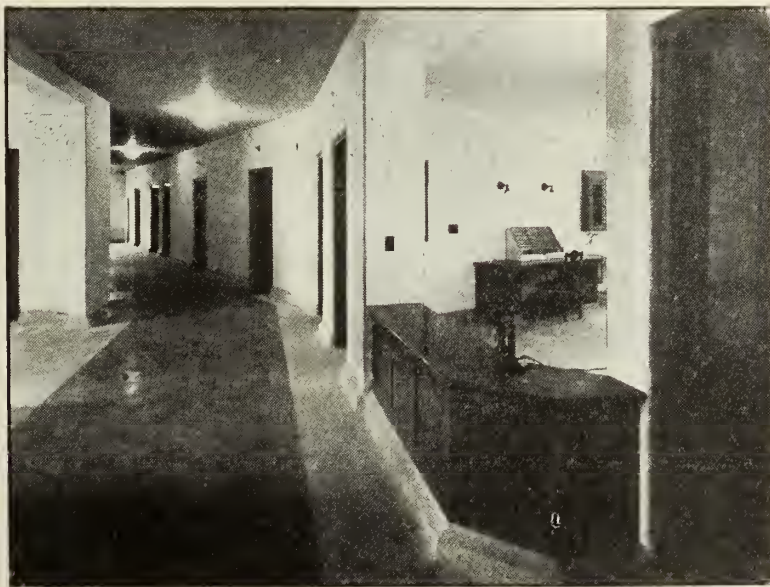


NURSERY

registered pharmacist.

The out-patient clinic is a new departure for private hospitals in this locality. It consists of a health clinic, a cancer clinic and a heart clinic. The out-patient department is open daily from 9:00 a. m. to 10:00 a. m. and from 2:00 to 3:00 in the afternoon. The

heart clinic is conducted from 7:00 to 8:00 in the evening. This out-patient service is intended for the indigent, and it is especially desirable that patients seeking its benefits be referred by physicians. The cancer clinic is under the supervision of the American Society for Control of Cancer. This clinic is open to



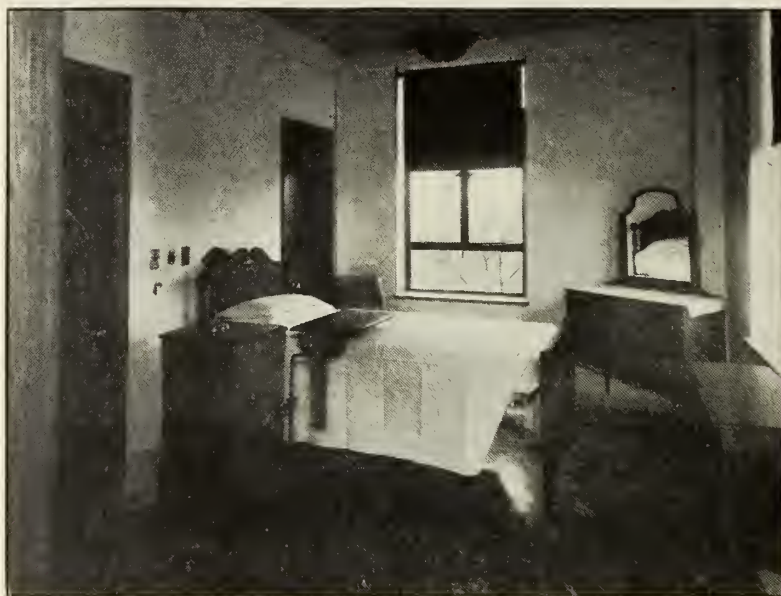
PATIENTS CORRIDOR



DELIVERY ROOM

anyone seeking diagnosis. The patients visiting this clinic will be referred back to their physicians with their diagnoses and recommendations for treatment. Treatment will be given only to such patients as are referred specifically for this purpose by their physicians.

Arrangements are near completion for an affiliation with the Rosenwald Foundation looking to the care of the "middle rate" patient. The purpose of this plan is to render service to those unable to pay full prices, either to the hospital or to the physician, and through an admission officer, who makes a



TYPICAL PRIVATE ROOM

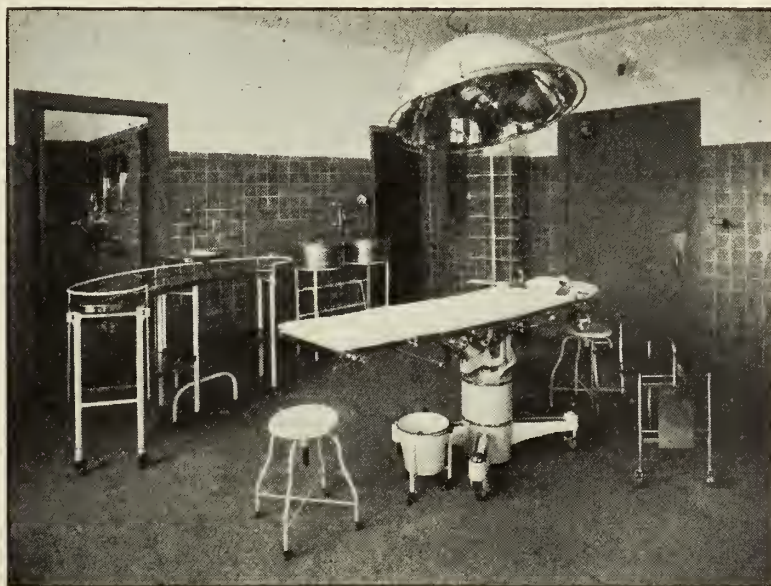




KITCHEN

careful investigation, a fixed charge is made covering all expenses incident to the hospital stay. Under no circumstances will charity patients be admitted to this service. The hospital has set aside fifteen beds for such

patients as qualify for this service, and it is hoped and believed that this provision will fill a long felt need and point the way to the prevention of socialization of medicine.



TYPICAL OPERATING ROOM

## ORIGINAL ARTICLES

SYMPOSIUM ON DISEASES OF THE  
KIDNEYNEOPLASMS OF THE KIDNEY, THEIR  
DIAGNOSIS AND TREATMENT\*

JAMES R. STITES, M. D.

Louisville.

All tumors of the kidney are diagnosed by two means. First by palpation, second by x-ray. As to what kinds of kidney tumors we have, this can only be determined by x-ray and cystoscopic study.

Considering tumors from the standpoint of enlargement only, we have many kinds; the pyonephritic, hydronephritic, single cysts, echinococcus cysts, polycystic kidneys and true neoplastic growths.

In hydronephrosis and pyonephrosis the diagnosis is very quickly determined after catheterization of the ureters and examination of the obtained urine. As to the diagnosis of cystic diseases of the kidney it will be taken up in the discussion of differential diagnosis in true tumors of the kidney.

True neoplasms of the kidney are as new growths elsewhere, divided first into two classes: The benign and malignant tumors.

Benign tumors of the kidney are extremely rare, the ones that are seen are adenoma, lipoma, and fibroma. These growths are of no particular clinical importance for they rarely give rise to symptoms. The fact that benign tumors of the kidney do occur, brings to mind an important point and that is namely; if malignancies of the kidney do not in some cases start as benign growths and if diagnosis were possible earlier, would not your results be far happier than they are in malignant cases when they come to surgery.

The malignant growths which are far more common than benign, present many varied kinds and we will not attempt to describe them at this time. As to their pathological classification, kidney tumors whether benign or malignant constitute only about 2% of all tumors.

Malignant tumors of the kidney in contrast to other malignancies are seen largely from infancy to five years of age and from forty to sixty. Tumors of the kidney are rarely seen in individuals between the ages of ten and forty. They are therefore tumors of infancy and adult life.

The embryoma as seen in childhood is a mixed type of neoplasm and rarely presents its symptoms until too far advanced to be able to offer your patient any hopes for cure. These tumors reach enormous size and metastasize early and are rapidly fatal, as

sarcomatous elements usually predominate.

The attempt to classify malignant tumors of the kidney is rather confused and confusing and I think most likely to be classified under the common term hypernephroma. These tumors are all carcinomatoid in type, they tend to involve the surrounding tissues, form metastases and kill the patient before invading the whole of the kidney itself. The tumors invade the renal veins very early, at times the involvement extending into the vena cava. This class of tumor is confined within the true kidney tissue and is usually encapsulated.

There is only one other type of renal malignancy which warrants some discussion before the subject of diagnosis is started, that is the papillomatous growths which occur in the renal pelvis. These are the same type of papillomas which are seen more often in other portions of the urinary tract. They may be single or multiple, are pedunculated and grow to extreme length and size and rather rapidly. It is not infrequent to see these tumors protruding from the urethral orifice when their base is in the renal pelvis. These are rapid growing of low grade malignancy, but recur far more rapidly than any other types and are transplanted along the ureter and in the bladder around the ureteral orifices of the involved kidney.

The diagnosis of renal neoplasms is an extremely interesting one from the urologists standpoint and brings up several interesting and at times rather difficult differential diagnosis.

The classical triad of symptoms of renal tumors is: hematuria, rectal tumors, renal pain.

Of hematuria there is no end of what may be said of its importance, not only as a guide to the diagnosis of renal tumor but to the important point of definitely determining its source and cause and by attention to this most important of all urinary symptoms, many patients' lives have been saved and their treatment greatly simplified. The other causes of hematuria you all know; but allow me to say that whenever a patient is seen with blood in his urine, unless the cause is definite beyond a shadow of doubt, do not stop in your search for its source and cause until every source has been exhausted. In a series of cases of seventy-three tumors of the bladder reported recently, the cardinal symptom of these patients was hematuria and the average duration of this symptom was three years. This same applies to hematuria of renal origin in a certain degree, for it is the rarest thing to find a bleeding renal tumor who does not give a history of bleeding at intervals over an exceedingly long period of time. I can therefore sum my advice to you in regard to hematuria in only one way,

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.



"Do Not Treat Hematuria with Medicine Out of a Bottle."

In regard to hematuria of renal origin especially that from tumors, it is usually painless, does not often clot, but is usually in sufficient amount to be noticed by the patient. It may however, be profuse enough that it may clot in the kidney pelvis and give rise to renal colic, or it may flow so freely through the ureter that it will later clot in the bladder and cause vesical pain and retention, but this is rare. Renal tumors are as a general rule palpable and the patient is usually emaciated from his disease before symptoms appear. Also the tumor has usually attained such size that it is palpable.

The pain associated with tumors of the kidney is entirely from pressure and is as a general rule rather vague and indefinite. The actual diagnosis is made by cystoscopic examination with catheterization of the ureters and pyelography. In cases of renal bleeding after the scope is introduced in the bladder both orifices should be watched carefully for a spurt of bloody urine before urethral catheters are passed, for at times the passage of urethral catheters themselves will cause considerable hemorrhage and thus obscure your picture. But when once bloody urine is seen to flow from a ureter then both ureters should be catheterized and specimen obtained.

Kidneys with renal tumors rapidly lose their secretory powers so that even in early hypernephrosis the output of P. S. P. is practically nil. Then your actual diagnosis is made by pyelography. The picture of a renal tumor with Iodide injected varies with the size of growth and the amount of involvement upon the renal pelvis. The calices in that portion of the kidney invaded by the tumor may be completely obliterated or blunted, the pelvis is this portion partially obscured by the growth, the remaining calices normal. Usually the irregularity of kidney mass is made out under the x-ray especially with your pyelographic media making a contrast. As the neoplasms encroach on the pelvis it causes displacement and enlargement of pelvis with calices much distended and gives the so-called spider leg deformity. The variations are many depending upon the extent of the growths and their location in the kidney. They may at times completely obliterate the renal pelvis and calices.

The appearance of pelvic distortion and changes in the calices brings up the importance of the differential diagnosis of extra renal tumors, and of cystic conditions of the kidney, either single cysts or polycystic findings. Usually in both extra renal tumors and cystic kidneys, hematuria is not often present but may be so. The distortions and

variations of the pelvis are almost identical with true renal neoplasms, but these kidneys are functioning kidneys and the urinary findings are negative. Cystic kidneys rarely bleed, they may be unilateral at times but are usually bilateral, especially the polycystic type and the urinary findings are normal as a general rule. Among the common extra renal tumors seen, are malignancies in the liver, gall-bladder or pancreas and retroperitoneal sarcomas, but their individual symptoms are usually sufficient to make your diagnosis.

The treatment of tumors of the kidney is the same as treatment of malignant tumors elsewhere: Namely complete removal of kidney pelvis and as much of the ureter and pedicle as safety will allow, followed by radiation in some form.

### BRIGHT'S DISEASE, PATHOLOGIC TYPES\*

E. S. MAXWELL, M. D.

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In studying lesions produced in the kidneys as a result of disease, it is necessary to consider the four histologic units, i. e., the blood vessels, the glomeruli, the tubules, and the interstitial tissue. Each of these tissues responds to an irritant in its own way. The only possible visible reaction to a toxic substance by the tubular epithelium is degeneration. The same toxin will produce quite different reactions in the glomeruli and interstitial tissue. At once we appreciate the difficulties in evaluating the changes occurring in an organ composed of such a variety of actively functioning structures exposed to so many irritants.

Clinicians and pathologists have attempted, since the time of Bright, to correlate the clinical picture and the lesions presented in the kidney at autopsy. Very little progress was made until Volhard and Fahr<sup>1</sup> in 1914, gave us the modern concept of this group of diseases which is conveniently named Bright's disease. More recent studies have been made by Addis<sup>2</sup>, Longcope<sup>3</sup>, Van Slyke, et al<sup>4</sup>, and Addis and Oliver<sup>5</sup>. Van Slyke, et al, and Addis and Oliver have published recently admirable monographs. They have presented thorough clinical and laboratory studies correlated with autopsy findings in a large group of cases. For additional literature one is referred to these monographs. I will follow the classification of Addis and Oliver, which is almost identical to that of Van Slyke, and not greatly different from Volhard and Fahr's.

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.



Fig. 1. Lipoid Degenerative Bright's Disease. High power magnification showing lipoid granules in tubular epithelium.

#### CLASSIFICATION

##### Degenerative Bright's Disease

Cryptic  
Pyogenic  
Non-bacterial

##### Hemorrhagic Bright's Disease

Initial  
Latent  
Active  
Terminal

##### Arteriosclerotic Bright's Disease

Most kidneys can be classified under one of these divisions although it is rare to find a pure degenerative, hemorrhagic or vascular disease. Usually one lesion will be outstanding with other less marked changes. In hemorrhagic nephritis we find practically always degeneration in the tubular epithelium and sclerosis of the blood vessels in addition to the marked inflammation in the glomeruli. In degenerative Bright's disease, the glomeruli and interstitial tissue show abnormalities. In the arteriosclerotic type glomerular inflammation and epithelial degeneration are present. These associated lesions often play an important part in the course of the disease.

#### DEGENERATIVE BRIGHT'S DISEASE (Nephrosis: Tubular Nephritis).

Certain toxic agents, when carried to the kidney by the blood, produce a prompt reaction in the epithelium of the convoluted tubules and to a lesser extent in the glomeruli. These changes are cloudy swelling, fatty degeneration and necrosis, the severity of the lesion depending on the nature and amount of the toxin. As a result of this the tubules are filled with desquamated degenerating cells. In one of the more frequent types

of true or cryptic nephrosis, the epithelial cells of the convoluted tubules are filled with small, highly refractile lipoid granules (Fig. 1). With this condition we find a large amount of albumin and usually lipoid granules in the urine. Some authorities designate this condition as lipoid nephrosis. The glomeruli show no visible changes although functional lesions are present, as is shown by the albumin which filters through the glomeruli. If the toxin is only transient, the epithelium will quickly regenerate and normal function be restored. If the toxic substances remain in the circulation, the degenerative process will be complicated by regenerative and proliferative lesions. Inflammation and connective tissue proliferation in the interstitial tissue may ultimately cause contraction and scarring of the organ. The obliteration of glomeruli and collapse of tubules along with alteration in the vascular supply of the kidney may produce a picture not unlike that of the "contracted kidney."

The nephrosis developing as a result of a chronic pyogenic process has, in addition to the degenerative changes in the tubular epithelium, an amyloid infiltration in the blood vessels and glomeruli. In this group inflammatory reactions in the interstitial tissue are extensive.

In the non-bacterial type the toxin usually is of short duration and no proliferative or inflammatory lesions are present. A frequent example is the "Bichloride Kidney." The epithelium lining the convoluted tubules may be completely destroyed by the overwhelming poison, and cessation of renal function may occur (Fig. 2). If the reaction is less severe, enough cells may remain to



Fig. 2. Degenerative Bright's Disease. High power magnification showing complete necrosis of epithelium in convoluted tubules following the therapeutic administration of salyrgan.



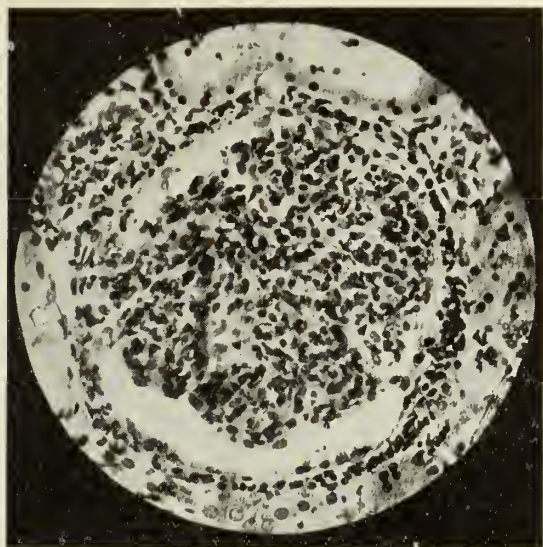


Fig. 3. Acute hemorrhagic Bright's disease. High power magnification of glomerulus showing a polynuclear infiltration in tufts and Bowman's capsule.

completely repair the damage by proliferation.

#### HEMORRHAGIC BRIGHT'S DISEASE (Glomerular Nephritis).

Considerable evidence tends to show that the lesion in the glomerulus in this group is due to a toxin originating in a streptococcus infection<sup>3</sup>. This toxin produces a violent reaction in the capillary bed of the glomerulus. The capillaries are dilated, red and white blood cells are extruded, protein leaks through and necrosis may occur. (Fig. 3). The inflammatory process continues and is governed by the amount and virulence of the irritating substance. The changes may be chiefly in the capillary loops, a fibrosis or necrosis, or an exudate may form in Bowman's space and by organization produce the characteristic crescents. The toxin may also damage the epithelium in the convoluted tubules, and degenerative lesions will further complicate the picture.

The interstitial tissue is affected by the bacterial poisons and here the striking lesion is inflammation. Degeneration and necrosis may occur but these changes are overshadowed by edema, hyperemia, and the exudation of leucocytes. The inflammation may be so severe and diffuse that renal insufficiency ends the picture or it may pass into the latent stage by the gradual disappearance of the inflammation until active changes are found in very few glomeruli. Scattered through the connective tissue may be seen small areas of scar tissue and round cell infiltration. A period of latency may be followed by a recurrence of an active stage and this recession and exacerbation of the active lesion may be repeated several times,

As the disease progresses by these irregular stages the proliferative inflammatory changes accumulate, a considerable portion of the parenchyma is destroyed and replaced by scar tissue. Many blood vessels show sclerosis with a narrowing or obliteration of the lumen (Fig. 4). If these lesions are diffuse, renal insufficiency may develop at any time and the patient die in uremia. In the terminal stage the active inflammation is replaced by collagen fibers, glomeruli are sclerosed, tubules collapse as a result of inactivity and with the contraction of scar tissue more parenchyma is destroyed. This continues until the few remaining glomeruli, which are abnormal, can no longer excrete the nitrogenous waste products and death occurs. The kidney is small, firm and cuts with resistance.

#### ARTERIOSCLEROTIC BRIGHT'S DISEASE (Nephrosclerosis)

In this condition we find an increased fibrous thickening of the intima and proliferation of the elastic fibers in the larger vessels. The lumen of the vessels is reduced. The vessels stand out in sections, greatly thickened and tortuous. The earlier changes are in the larger vessels only and are a part of generalized arteriosclerosis. Eventually the arterioles are affected and the sclerosing process extends to and destroys the glomerulus. The tubule from a sclerosed glomerulus atrophies, and along with this there is a proliferation of interstitial connective tissue (Fig. 5). This process continues until much parenchyma is destroyed and, due to the contraction of the interstitial tissue, scars are formed and the kidney reduced in size. These processes usually are quite slow.



Fig. 4. Terminal hemorrhagic Bright's disease. Two glomeruli show complete sclerosis, others show active inflammation. The interstitial tissue is infiltrated with round cells.



In most cases the process is interrupted long before renal insufficiency develops by some extra-renal arterial accident. Occasionally along with the vascular changes a striking inflammatory reaction is seen in the interstitial tissue, and to a lesser degree in the glomeruli. With these added lesions the destructive process is more rapid and the course may be similar to hemorrhagic Bright's. The more rapidly advancing lesion involving the smaller arterioles, with considerable inflammation in the interstitial tissue, is given a separate classification by some writers and is called "malignant nephrosclerosis" (Fig. 6). Addis and Oliver and Van Slyke think that the pathogenesis is the same, the difference being one of degree. When the smaller arterioles are involved it is termed arteriolar Bright's Disease.

Focal embolic nephritis occurs only when associated with bacterial endocarditis. The lesions are embolic and not diffuse, usually involving a part of a glomerulus. Renal function is rarely interfered with.

Acute diffuse interstitial nephritis is associated with certain exanthemata. The lesion is inflammatory and interstitial in distribution. It has no connection whatever with the condition formerly termed chronic interstitial nephritis.

The kidney in the terminal stages of hemorrhagic and arteriosclerotic nephritis are usually small and granular with adherent capsules. The normal architecture is entirely destroyed.

Kidneys are found at autopsy in which the changes in the glomeruli and blood vessels are so extensive and diffuse that it is impossible

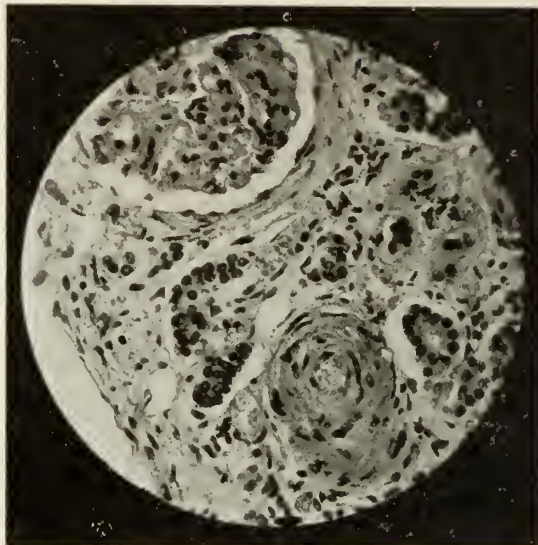


Fig. 6. Arteriosclerotic Bright's disease. High power magnification showing obliteration of arteriole.

to determine which was the primary lesion. The scars from long past inflammation tell us little of the nature of the primary lesion. Frequently the clinical history will be of assistance in properly grouping these lesions.

This classification of Bright's Disease is not entirely satisfactory. More carefully correlated clinical and pathological studies, such as Van Slyke, et al, and Addis and Oliver, will lead to a better understanding of this frequent and debilitating malady.

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Fig. 5. Arteriosclerotic Bright's disease showing sclerosis of a larger arteriole, a fibrosed glomerulus and lymphoid deposit in the interstitial tissue. The tubules are atrophic.

**Irrigation of Peritoneal Cavity for Suppurative Peritonitis.**—Lurje and Matis are greatly impressed with the value of continuous irrigation of the peritoneal cavity with physiologic solution of sodium chloride as a part of the surgical technic in cases of suppurative peritonitis. In addition to the usual incision (as, for instance, when operating for an inflamed appendix) a puncture is made in the epigastric region. Through this opening continuous irrigation the peritoneal cavity is made during the course of the operation. This procedure ensures thorough cleansing of the upper abdominal cavity. The danger of infection is reduced to and evacuation of the lower portion of the cavity. The danger of infection is reduced to a minimum and the condition of the patient after operation is vastly improved. There is less nausea and vomiting, and more general comfort and the bowel evacuates itself without other help.



## CLINICAL TYPES OF NEPHRITIS\*

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Charecot and Virchow constantly taught the great importance of a clear visual anatomical idea of all diseased processes. The knowledge that comes from a study of the disease itself can never be replaced by experimental pathology, medicine and surgery. The definition of the word "process" is "a forward movement," "change," "course." Pathological processes, therefore, should not be regarded as stationary, of uniform appearance or progressing with mathematical precision in temporary arrangement. With every change there is a change in the individual reaction on the part of the organism. Consequently one might truly say there are as many diseases as there are diseased individuals. A thorough understanding of these possible variations is most important in the grouping of diseases and the stricter and more circumscribed a classification, the more faulty it will always be. (1) This is probably truer of Bright's disease than almost any other disease. For many years praiseworthy efforts by both pathologist and clinicians have been made to correlate the clinical picture with the pathological lesion. Many have been discarded or become obsolete, others have caused much discussion and more confusion, and concerning the most recent attempts and having to do largely with the term Nephrosis one is reminded of a quotation from Milton's "Paradise Lost," "with ruin upon ruin, rout on rout, confusion worse confounded." However, many well recognized and definitely proven facts stand out so clearly that if one duly appreciates the many variables, it still seems possible to link the clinical picture with the actual pathology. Because of the changing symptomatology (which is sometimes very rapid) it seems advisable to make our classification on a pathological basis,—one which is at the same time both simple and sufficiently accurate. It should primarily indicate the part or parts of the kidney involved, and by simple subdivisions it should indicate the course of the disease, whether acute or chronic and it should give us an idea of the nature of the lesion, whether inflammatory or degenerative. Above all, if it is to be practical, such a classification should be possible by a thorough knowledge of the history and a study of the urine and the blood pressure, qualifications possessed by every practitioner of medicine without the aid of elaborate laboratory equipment.

It is important that one have a general

knowledge of the blood circulation of the kidney and the secretion of urine. Blood enters the glomeruli by the afferent artery, under very high pressure, from the branches of the renal artery, which is a short, thick branch given off directly from the aorta. It immediately breaks up into a vascular net work, known as the capillary tuft, which is enclosed or suspended in Bowman's capsule. It then leaves the glomeruli by the much smaller efferent artery, which immediately breaks up into numerous capillaries which follow and supply the convoluted tubules. It is quite evident, therefore, that the blood, before reaching the tubules, must pass through the glomeruli. This simple fact, as will be seen later, is the basis for the pathological lesion and the clinical picture of the Glomerulo-Nephritides. Assuming for the glomerular tuft a permeability (which is filtrative or transudative,) and the high pressure under which the blood enters by the afferent artery, and still higher as it courses through the capillary tuft, one appreciates the necessary conditions for the separation from the blood of water and the waste products of metabolism, consisting chiefly of sodium chloride and nitrogenous substances. This watery element then passes directly into the proximal convoluted tubule and by referring to the diagram one appreciates the long tortuous course of one of these units, on through the three parts of Henle's loops, into the distal convoluted tubule and from there to the series of collecting tubules which end in the pelvis of the kidney. In this long tortuous course one must consider the different calibre of the tubules and the abrupt change from the broad convoluted tubule to that of the straight narrow limb of Henle, and the interpolation of the second but much shorter convoluted portion, which empties into the collecting tubules. This anatomical arrangement coupled with specific properties of the tubular epithelium (whether this be secretory or absorptive) explains the amount of urine as well as its specific gravity. With this fundamental knowledge of the glomeruli and the tubules it seems justifiable to speak of lesions arising in the former as Glomerulo-Nephritis and those arising in the latter as Tubular Nephritis, notwithstanding the usual degenerative type of the lesion, which may be indicated under the subdivision of Nephrosis. The great frequency with which these parts of the kidney are simultaneously involved must be kept in mind. For the third group we have the sclerotic changes which involve the small arteries and arterioles of the kidney as well as throughout the entire body, and is in reality an arteriolar sclerosis, but which is included under the general head of Renal Arteriosclerosis. The subdivisions in each group are easily determined by the his-

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

tory and the symptoms.

(1) *Glomerulo-Nephritis*: The lesion arises in some part of the glomerulus, is inflammatory in character and while generally believed to represent the reaction on the part of the Glomeruli to infection (usually streptococci) in other parts of the body, Ophuls has demonstrated by staining methods the actual presence of streptococci in many of these kidneys. It is well to remember that the kidneys contain several millions of these glomerulo-tubular units and that less than half this number are necessary to carry on renal function. As indicated by the chart, blood in the urine (barring the remainder of the urinary tract, surgical disease of the kidney and constitutional disease) is the dominant feature of the acute inflammatory lesions which for the sake of clearness are divided into three groups:

(a) *Embolic*,—as the name implies the lesion consists of emboli in one or more of the smaller vessels of the capillary tuft which ruptures and allows red blood cells to pass directly to the urine. There is no disturbance of renal function, and when hematuria occurs, without the history of an acute infection, one can safely and surely diagnose Subacute Bacterial Endocarditis—due to *Streptococci Viridans*.

(b) *Non-embolic*, the lesion is not embolic but is focally distributed throughout the glomeruli, and the hematuria is again due to a ruptured capillary in the glomerular tuft. The findings are identical with the embolic type but the history of upper respiratory tract infections, as well as Erysipelas, wound infections and the first week of scarlet fever, establishes the character of the lesion.

(c) *Acute Diffuse Nephritis*: Here the lesion is more extensive and should be suspected by the onset of scanty urine, diffuse oedema, especially of the face and eyes, and the history of a preceding acute infection. It is rare after the age of thirty-five and is not an unusual sequel to scarlet fever after nineteen to twenty-one days or one to two weeks after throat infections. Occasionally it occurs one or two days after exposure to wet and cold but these are probably only contributing factors. The first lesion is in the glomerular capillaries producing hemorrhage, so that hematuria is again the dominant urinary finding. At times the quantity is sufficient to give the urine a smoky appearance. The glomeruli of both kidneys are uniformly involved. There is proliferation and swelling of the endothelium which hinders the flow of blood through the capillaries. Since the water of the urine comes from the blood by passage of deproteinized plasma through the glomeruli, the urine is scanty, highly colored and of high specific gravity, or suppressed because the blood

does not reach the glomerular filter at all or in insufficient quantities. Albumin is present in the urine in large quantities which is derived from the abundant exudate and free blood, and a variety of casts are to be found. There is an increase of the waste products in the blood, the phenolsulphonphthalein output is greatly diminished, at times the eye-grounds show swelling of the discs and narrow arteries and convulsions are frequent. If the glomerular lesion is not too wide spread or too severe and the primary lesion is removed, the patient may return to health or pass into the stage of chronic glomerular nephritis or in the process of healing leave scars that have so damaged the kidney that normal function cannot be carried on.

(d) *Chronic Glomerulo-Nephritis*: In considering this group we must admit a violation of our classification, since we must recognize the degenerative changes that are so intimately associated with the clinical picture. Presumably, however, they are largely secondary. By referring to the diagram, it is seen that the tubules receive their supply of blood from the numerous small branches of the glomerular efferent vessels. It naturally follows, therefore, that any process which will prevent the flow of blood through the glomeruli will result in degeneration of the corresponding tubules. Following subsidence of the acute lesion there is a gradual proliferation of the lining epithelium and endothelium of the glomerular tuft, with an exudation which extends into the capsule, and often proliferation of epithelial cells toward the center, destroying the permeability of the tuft and resulting in obliteration of the glomeruli with the disappearance of its corresponding tubule. Naturally the clinical picture will vary with the extent of the pathological lesion, which in turn will vary with the length of time the patient can survive the disease. This may be only a short time or it may be a period of many years during which there are frequent recurrent attacks. With the latter there may be little or no impairment of function for a long time and one of two clinical pictures may be present. First, marked albuminuria, edema, normal or moderate increase in blood pressure, no increase in blood nitrogenous waste products, but dilution and concentration tests (when free of edema) indicating impairment of function. Frequently the loss of albumin is so great that the proteins of the blood plasma are reduced and an increase of cholesterol in the blood will be found as in lipid nephrosis. However, with the onset of hypertension, and later uremia, the nature of the lesion is made clear. This probably represents the subacute type which is the transitional change between the acute type and the chronic, the latter forming the second picture which is domi-



nated by a high blood pressure and varying degrees of albuminuria, the former may persist so long without other symptoms that benign or essential hypertension is suggested. The history of previous acute nephritis, however, is practically diagnostic. Furthermore, there is a larger amount of albumin and a relative higher diastolic than systolic pressure. The patient is anemic and looks pale (White Hypertension of Volhard) while in benign hypertension the patient is full blooded and not anemic (Red Hypertension of Volhard). The process may be so slow that it is many years before so many glomeruli and tubules are destroyed that minimal function is no longer possible. With the terminal stage, therefore, there is a loss of concentrating and diluting power of the tubules with the quantity of urine greatly increased and the specific gravity fixed at a low level. The amount of albumin varies with the amount of exudate in the remaining glomeruli. There is a pronounced anemia and cardiac hypertrophy now contributes to the clinical picture. Waste products accumulate in the blood and the diastolic and systolic blood pressure reaches high figures. Pericarditis is frequently present and the eye grounds show characteristic vascular changes, with hemorrhages and exudates. It is often difficult or impossible to differentiate from the terminal stage of malignant sclerosis—nor is there very convincing proof that there is a difference.

(2) Renal Arterio-Sclerosis: As the name implies this group concerns primarily changes in the renal arterial system. There is a moderate degree of sclerosis of the renal artery and larger branches in elderly people and at times in diabetes, but it is without symptoms, is of no clinical significance and is not due to nephritis. There is strong suggestive evidence in very recent literature (2) to indicate that irrespective of their etiologies there is no fundamental difference in the pathogenesis of benign and malignant renal arteriosclerosis (nephrosclerosis, hypertension). "Both depend on a hyperemia associated with a retardation of flow, and not on glomerular ischemia or on arteriolar occlusion. While the former is present and may well be accepted as the cause of uremia, but as such it is not the basis for the characteristic pathologic changes which were intimately associated with a direct hyperemia. Blood passes through these kidneys with great slowness and difficulty, even at very high pressures. The retardation is based on a neurogenic dissociation in reaction between arterial constriction and peripheral dilatation and the changes that follow are analyzed on the basis of Ricker's views on renal hemodynamics. Moderate retardation leads slowly to the organic changes of benign nephrosclerosis

and severe retardation induces the pathologic changes of malignant nephrosclerosis and terminates in uremia."

Since, however, there is a well marked difference in the clinical pictures, it seems advisable to adhere to the well known and generally accepted (to this time) divisions of Renal Arteriosclerosis.

(a) Benign Arteriosclerosis (essential hypertension, renal arteriosclerosis without insufficiency, etc.): Hypertension is the dominant feature of the clinical picture and there is nothing from the studies of the urine, or from the various renal functional tests to show any impairment of renal function. The retinal changes are those of arteriosclerosis. The cause is unknown, the progress is slow, rarely appearing before the age of thirty-five and a majority becoming permanent about fifty. It occurs frequently and is of great clinical significance. It is benign for the kidney except as it represents a part of a general arterial disease with similar changes occurring in small arteries of other parts of the body. While death in a majority of the cases comes from the coronary arteries or arterial disease of the brain, a few die from renal insufficiency and uremia, lending strength to the belief that the pathogenesis is the same as in malignant hypertension, varying only in the time required to produce the uremia. There is narrowing and frequent closing (?) of some afferent vessels so that the glomeruli receive no blood, collapse and are surrounded by connective tissue and finally are completely obliterated, following which the corresponding tubules disappear. A sufficient number are left, however, that function is not much, if any, impaired.

(b) Malignant Arteriosclerosis (malignant hypertension, renal arteriosclerosis with insufficiency, primary contracted kidney, etc.): Few facts are known concerning the onset of this condition. We do know that the terminal stage is the same as, and cannot be differentiated from, the terminal stage of chronic glomerulo-nephritis, except that in the latter we have a history of preceding acute nephritis with infection. What we do not know, however, is whether malignant hypertension really represents a secondary process, or an acute exacerbation involving the few remaining glomerulo-tubular units, the great majority of which were destroyed by an inflammation, degeneration and exudation, occurring fifteen, twenty or even thirty years previously—most frequently after scarlet fever. Recovery was apparent rather than real, because enough glomeruli escaped to maintain a fair degree of function. The disease continued, however, slowly but progressively until an acute exacerbation rapidly destroyed what function remained. There is much very strong evidence to support such

a belief. Be this as it may the clinical picture is quite clear. It usually begins earlier than benign hypertension (which again suggests a secondary process) sometimes in the second or even the first decade. Added to the characteristic changes already described in the arteries and arterioles, are inflammatory changes in the intima of these vessels, with necrotic changes in the walls, in focal distribution. This would agree perfectly with our theoretical conception of the pathological lesion from an acute exacerbation, when, what comparatively few glomerulo-tubular units remaining contain scars from a healed glomerulo-nephritis where the lesion was in focal distribution.

Many afferent arteries become occluded, followed by collapse and disappearance of the glomeruli and then disappearance of the corresponding tubule which is often replaced by fibrous tissue (so-called chronic interstitial nephritis). At times the inflammatory changes in the glomeruli are so few that Volhard and Fahr used the term "Combination Form" to indicate chronic glomerulo-nephritis superimposed on the kidney of essential hypertension. At any rate it seems to be agreed that the pathological process as well as the clinical picture is associated with if not actually the result of rapidly diminished blood supply.

Naturally the signs and symptoms vary according to the extent of the lesion but in the terminal stages they do not differ from the terminal stages of chronic nephritis.

(3) Tubular Nephritis: Because of the uncertainty and difference of opinion concerning the term Nephrosis it seems advisable to make our third classification to indicate the tubules of the kidney as the part that is predominantly involved and degeneration as the chief pathological characteristic. By subdivision we can discuss the various types of degeneration and thus avoid the misconceptions that have arisen by using "Nephrosis" as one of the main classifications and which has come to include extreme albuminuria and marked edema as the dominant clinical characteristics. There are several simple forms of degeneration, depending upon alterations in the normal constituents of the cells and in the accumulation of abnormal substances, which frequently result in damage to function.

Of the first, albuminous degeneration is most common and consists of fine albuminous granules through the cell body which at times are in the form of small or large spherical bodies or as vacuoles. There is swelling of the tubule from the imbibition of water, a disturbance in size and arrangement of Altman's granules which may be responsible, but most likely, as Fahr believes, it represents the ordinary cloudy swelling caused by

toxins of most bacterial and other poisons. The only symptoms are an occasional trace of albumin and a few granular casts in the urine. This probably is the first step in the process caused by some metallic poisons such as phosphorous, chromium and of corrosive sublimate, which is the most common. At times mild degrees are seen as a complication of such infections as cholera, yellow fever, diphtheria, etc. Here the findings are more marked, consisting of larger quantities of albumin, many casts and detritus; pus and red cells are frequent but not a feature; oliguria is a constant feature and often there is suppression which, if persistent, causes nitrogenous waste matters to accumulate in the blood but never to an alarming figure and they are never the cause of death. Dropsy and high blood pressure are rare and the eye grounds are negative. It is notable that while changes in the urine are similar to those in frank inflammatory lesions they do not cause dropsy, dyspnea, hypertension, or eyeground changes even with the wholesale destruction of epithelium of the convoluted tubules and uremia is only caused through suppression of urine. Of the abnormal substances accumulating in the cells, refractive fat is the most common and is in fact the most frequent alteration in all kinds of nephritis and is found even in some normal kidneys. When considerable, it is probably due to deteriorated or disturbed cell function. Here blood fat is excessive, as in lipemic diabetes or as a product of disintegrating protoplasm from dying cells; all forms of degeneration as well as all kinds of nephritis are found. Clinically, there are no symptoms except neutral fat in the urine and in the casts and it is very doubtful if this alone is responsible. Other substances which may damage the cell structure and cell function, if accumulating in excessive quantities in the tubular epithelium are glycogen in Henle's loop, in diabetes; uric acid in the renal epithelium, but not damaging the kidney as a whole, found in gout and other conditions; haemoglobin and other blood pigments in the renal cells, sufficient to distort and damage, found in blood destruction. Bile may load the tubular epithelium and be associated with albuminous degeneration, albumin and bile stained granular casts in the urine.

(a) Lipoid Nephrosis: It is this term that is causing at the present time so much discussion, largely because of its similarity in many instances to chronic nephritis. The term "nephrosis" was advocated by Muller to indicate non-inflammatory lesions of the kidney, and a special variety was described by Munk as lipoid nephrosis and in this country by Epstein as chronic nephrosis. All are intended to stress degeneration as the chief pathological picture, but since the le-



sion is not strictly confined to the tubular epithelium, but involves to a greater or lesser extent the glomeruli, blood vessels and stroma as well, and the symptoms in each include massive albuminuria and dropsy, the reason will immediately be seen for the discussion and disagreement that now exists. True lipid nephrosis is an extremely rare disease, occurring probably once in many thousands of cases. Its chief characteristics are marked albuminuria and edema without hypertension, cardiac hypertrophy, increased waste products in the blood, or diminished phenol-sulphonphthalein output and with dilution and concentration tests normal. In fact, if any of these signs of renal insufficiency should be present it would indicate a nephritis more than a nephrosis. One of the chief characteristics of the disease is the reduction of the total proteins of the blood plasma from a normal of six to eight per cent to four per cent or lower. This reduction is in the albumin factor (from loss of albumin in the urine), the globulin remaining normal or actually increased. The blood cholesterol reaches very high figures, up to 800 mg. or more per 100 c. c. of blood. The calcium of the blood is low and the basal metabolic rate is lowered, thus adding strength to the prevailing thought that this is a general metabolic disease, shared by thyroid deficiency, and with the kidney lesion not primary but only a part of the general process. In addition to the early changes already described and consisting of doubly refractive fat in the epithelial cells and sometimes the interstitial tissue, the cells are filled with lipid, are swollen and desquamate. When there is a complete blocking of the tubule from this degenerative proliferation, there is destruction of the associated glomerulus. There is practically always a deposit of hyaline substances also in the glomerular vascular loops which are thickened. There may be increase in the tuft cells and the capsule, with final shrinkage and atrophy. There is lipid in the tubular stroma as well as definite streaky increase in the connective tissue cells and fibres. The disease is of slow development, and long standing, and the tubular cells are found in different stages of deterioration. Regenerative cells have been described by Fahr. In many cases autopsy has proven the presence of a nephritis, while many others with a clinical diagnosis of nephrosis, have no autopsy proof. It can certainly be said that lipid in the tubular epithelium and with little pathology in the glomerular stroma or blood vessels, is an extreme rarity. Inter-current infections may lead to fatal termination and acute infections may lead to a return of the nephrosis.

(b) Amyloid or Waxy Kidney: Many, notably Fahr and Munk, retain this in the

nephrosis group. There are, however, a few differences which consist chiefly in the deposit of amyloid substances in the walls of the glomerular loops of the small arteries of the cortex. There is similar droplet, fatty or lipid degeneration of the tubular epithelium, with later increase in connective tissue stroma, at times to such extent that there is compression and destruction of secretory elements. Later there is sclerosis of the arterial branch which may result in narrowing or occlusion of vascular loops and in multiplication of tuft cells which are limited to part of the glomeruli, and of very uneven development in different glomeruli. In time the glomeruli become almost structureless balls of hyaline connective tissue. The cause is unknown, but it occurs in various organs as a result of long standing tuberculosis or prolonged suppuration, especially in bones. Symptoms are absent in minimal lesions but as they progress they are the same as in lipid nephrosis, except possibly for a greater volume of urine, lower specific gravity, and lipemia much less pronounced, or even absent. The dropsy is not proportionate to the amyloid deposits and with complete atrophy, uremia develops and hyperemia is likely to occur.

(c) Eclamptic Kidney: This is a very obscure condition. The idea is gaining ground that the renal lesions are due to a toxin (not of renal origin) circulating in the blood and, therefore, to be regarded as secondary and degenerative. It is not believed that the failure of renal function causes or contributes in any important way to the symptoms. On such a basis it is tentatively included in the nephrosis group.

It seems, however, that the term Nephrosis is temporarily at least fixed, in modern classifications. One should appreciate the disadvantages of the term and above all not look upon dropsy as synonymous or even essential to the diagnosis. One would be almost certainly correct if he used it in nearly every case of pneumonia and other bacterial infections. The diagnosis of lipid nephrosis, without qualification, is inadequate, since there is only one chance in many thousand that this is true. If the patient has been a long sufferer from tuberculosis or suppuration he may have a waxy kidney but it is overwhelmingly probable that autopsy would reveal a nephritis and not a nephrosis. Before passing on to the treatment of these various types of renal lesions it seems advisable to call attention to some recent work on edema which has great diagnostic as well as therapeutic significance (3) (4) (5). The edema we are accustomed to think of in connection with kidney disease, and changes in the permeability of the blood vessels of the body, is rich in protein, similar to an inflam-

matory exudate and can be produced experimentally by using a variety of irritants—so-called capillary poisons. It has recently been demonstrated, however, that edema may arise without renal, cardiac or capillary damage as the significant factors. Diet, low in proteins, will at times produce low protein content of blood plasma, and edema practically always appears when it drops to 3%. This probably explains the so-called war dropsies that have been imitated experimentally on animals kept on low protein diets. This type of edema has been produced also by direct removal of plasma proteins from the blood by plasmapheresis, and is quite unlike the exudative type occurring in nephritis. A good explanation was given by an hypothesis ventured years ago by Starling, to the effect that the exchange of water between the blood and the tissue fluids through the capillary wall is determined by a delicate balance between the hydrostatic pressure in the capillaries and the osmotic pressure of the plasma proteins. Removal of the latter would lead to filtration of protein-free fluid into the tissues and thus explain the edema of nephrosis. It can be precipitated in a massive way by administration of large amounts of fluid. It is necessary, therefore, in the future for the clinician to determine the difference between edema fluids and thus aid in the discovery of the underlying cause in the individual case, whether it be from damage to the vascular system or some metabolic process that lowers plasma proteins (5).

#### TREATMENT

**Acute Nephritis:** Nothing new has developed in recent years that will have any specific influence on the healing of the acute lesion. It is advisable, therefore, to treat the patient on sound physiological principles and not the kidney particularly. In those cases where the source of the toxin cannot be removed, fluids should be forced, in order that the toxins reach the kidney in greater dilutions and less likely to produce lesions. On general principles the kidney should be spared as much as possible, by reducing to a minimum those elements that it normally excretes. Water, the chief excretory substance, has come in for the most discussion. Since evidence is lacking as to the quantity required, one will be guided by the difficulty or ease with which it is excreted, limiting the intake to no less than 1000 c. e. in the former and probably as high as 3000 c. e. in the latter. The question of solids is much simpler. By both mental and physical rest less tissue waste is sent to the kidneys and less protein is required in the diet to replace such waste, and consequently the burden of excreting nitrogenous products is greatly lessened. The salt intake should also

be reduced, ordinarily 20 to 30 gms. of protein and 2 gms. of salt are sufficient. Our present knowledge will not permit any decision as to whether an alkaline or acid urine is desirable, nor are we reliably informed as to injurious effects of the coloring matter of food stuffs or other substances that may be excreted in the urine. Naturally excretion should be encouraged through other channels, bowel, skin, etc. Experimental evidence indicates that diuretics are dangerous and although some clinical evidence, based perhaps upon loose observation, favor increasing fluid output by diuretics, it would seem wise not to use them and adhere to the principle of resting the kidney as much as possible.

There has been a very definite advance in the etiology and treatment of uremia in children. Blackfan and associates have shown that it is not caused by a heaping up of nitrogenous products in the blood but by edema of the brain. It can be definitely influenced by the use of magnesium sulphate, using first by mouth and rectum to reduce the blood pressure and failing in this it may be given intravenously in 1% solution up to 200 c. c. if necessary.

The physician must decide whether foci of infection should be removed and if so, at what stage. Bacterial toxins from tonsillitis and other acute infections certainly produce acute nephritis at times, but there is room for reasonable doubt concerning the toxins of bacteria arising from the more chronic and less virulent types of infection, such as the crypts of hypertrophied tonsils, silent abscesses at roots of teeth, chronic catarrhal sinus conditions etc. When there are repeated recurrences of acute attacks, or if following the acute nephritis there persists slight evidence of the disease one should probably be radical and remove these silent foci but it seems hardly necessary to do it hurriedly. Six months or a year of careful rest and treatment should be insisted upon before one can feel that albumin, casts, and blood cells in the urine represent chronic nephritis and no longer capable of returning to normal.

**Chronic Nephritis:** Again nothing in the way of specific medication has been added to our knowledge of treatment. The same general principles as outlined for acute nephritis are applicable to the chronic. Fluid intake should arbitrarily be fixed at about 2000 c. e. The question of diuretics likewise remains unsettled in the chronic form. In my opinion it is not for the physician to decide whether the imposition of most burdensome restrictions, hoping to add a few weeks or months to a more or less miserable existence is justifiable. The desires of the patient are to be considered. Quite probably the medical profession does not know how to



prevent the steady development of chronic nephritis. Then how should we advise those symptomless cases where the urine analysis indicates beginning chronic nephritis? On general principles the patient should of course avoid all excesses, but if he is leading a fairly normal active life, should his habits of work, play and diet, or the use of tobacco, alcohol, tea and coffee be changed? Will anything be gained? There is very little evidence to support such a view point.

**Sub-Acute Nephritis:** Remembering that this represents more of a transitional stage with edema due to extensive tubular involvement as the outstanding symptom, more attention should be paid to rest and relieving the load on the kidneys that is necessary in the more chronic form. Many of these patients will pass through this edematous stage to symptomatic health, but will continue to have albumin and casts in the urine, indicating continued degenerative changes in the kidney and renal insufficiency. The treatment is practically the same as that for the nephroses.

**Renal Arteriosclerosis:** The treatment of the benign is that of general arteriosclerosis and the same mechanism is responsible for the changes seen elsewhere in the body. The cause is unknown and it has never been proven that high protein diets, gout, diabetes, alcohol and tobacco are factors. McClelland and Dubois (7) kept two normal men on a meat diet for a year—consisting of as a sample menu: Breakfast, lean beef 190 gms., fat 100 gms.; Dinner, liver 200 gms., fat 75 gms. Supper, lean beef 200 gms., marrow 70 gms., and coffee, black tea, meat broth and water one to two quarts daily. At the end of their observation both men were in good physical condition without subjective or objective evidence of any loss of physical or mental vigor. Despite the usual belief there was no elevation of either systolic or diastolic blood pressure, there was no abnormality in the quantity, specific gravity or constituents of the urine, and no albumin, casts or blood at any time. No evidence of irritation nor damage to kidney function (opposed to Newbury and Associates) as indicated by normal urine, normal phenolsulphonphthalein output, normal quantities of nitrogenous products in the blood and no x-ray evidence of kidney hypertrophy.

For the malignant form the treatment is the same as for the terminal stage of chronic nephritis which it closely resembles and with which it is probably identical.

**Nephrosis:** Almost a complete revolution in the treatment of this type has arisen with the newer knowledge of the processes involved. To make up for the excessive amount of albumin lost in the urine, and which causes a depletion of protein from the blood plasma,

diets containing from 150 to 250 gms. of protein are recommended. On account of the high cholesterol content of the blood the fats in the diet should be greatly lowered. Thyroid is indicated and has been proven beneficial, presumably because of the lowered metabolic rate suggesting diminished thyroid activity. For the disturbance of calcium metabolism which frequently exists and indicated by low figures for blood calcium, the calcium salts and the parathyroid hormone will most likely prove helpful. Of the numerous diuretics that have been employed, those containing mercury and marketed under the trade name of Novasurol and Salyr-gan (the latter less irritating and likely to produce reaction) have been used with marked relief of the edema. It is given subcutaneously, intramuscularly or intravenously, the latter method preferable. One to three c. c. every two or three days is the proper amount and it apparently acts better with the frequent administration per os of rather large doses of the ammonium salts, (the chloride or nitrate.)

The presence of anemia which is so common in nephritics with edema has not been stressed because in my opinion there are so many variables to help account for it. I do desire, however, to say that transfusions of blood have no untoward results. Anemia and other complications are no more common than in other conditions and in some cases an existing anuria has been benefited, not through any diuretic effect of the blood, but by improvement of renal function. It does not raise blood pressure, does not injure kidneys and neither relieves nor aggravates uremic symptoms. It offers, however, the most suitable means of treating the secondary anemia accompanying marked renal insufficiency, and to which patients, a high protein diet could not be given because of the retention uremia that would follow. When the kidneys are moderately involved it will ameliorate a serious condition for a long time. As a rule several successive transfusions are necessary to restore the hemoglobin and red blood cells to normal (6).

Finally the belief is becoming more and more prevalent that the symptoms we have so long been accustomed to associate with Bright's disease are the manifestations of a constitutional disturbance that, through the peculiar adaption of the kidney to accurate clinical and pathological studies, makes itself known in a disturbance of renal function. Similar inflammatory and degenerative processes are also occurring in other organs in which the opportunity for study is nil or relatively limited.

The data above presented is the result of a study of more than one hundred cases of nephritis in my own private work and a

rather extensive study of the literature. Since there are only a few specific references, although the thought and at times almost verbatim quotations are inserted it seems advisable to give a general resume of the literature that has been used. Each of the cited authors includes in his discussion reference to other publications which will cover very thoroughly the present subject of all phases of nephritis.

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**Temperature Reaction Following Subtotal Thyroidectomy.**—Lerman says that the degree and duration of the temperature reaction following subtotal thyroidectomy for exophthalmic goiter does not bear any relationship to the severity of the disease as judged from the average initial metabolic rate. This reaction is not influenced by the degree of fever present before operation. A slight elevation of temperature, even though it is associated with a mild, protracted upper respiratory infection, is no contraindication to operation. The maximum height of the postoperative temperature reaction does not vary with the season of the year but the duration of the reaction is definitely longer in the late winter and early spring than in the summer and early fall.

## INTRAVENOUS UROGRAPHY\*

E. H. RAY, M. D.

Lexington.

Probably the most important advance made in urological diagnosis since the introduction of urinary tract visualization by means of the direct injection of an opaque fluid through the ureteral catheter has been the development of urinary tract visualization by means of a substance which when injected into the vein of the subject is concentrated in sufficient strength in the kidney to be opaque to the x-ray.

In 1923 Rowntree and his associates published the first positive results along this line using sodium iodide intravenously and showing conclusively that intravenous urography was possible. Much further work was done by many others but not until 1926 when Swick working in von Lichtenberg's clinic in Berlin introduced uroselectan was intravenous urography made practicable. Almost a year later in 1930 Bronner and Schueller working in Cologne, Germany, began using what they called Abrodil with equally good results.

Both of these substances depend upon iodine for their shadow casting qualities and without going into detail concerning their chemistry I will simply say that Uroselectan contains 42% of organically bound iodine and Abrodil contains 52% of the same thing. Abrodil has been introduced to this country under the trade name of Skiodan and will hereafter in this paper be referred to by that name.

While these substances have proven almost indispensable for the proper diagnosis of certain cases it must not be thought that they have in any way supplanted the usual cystoscopic procedures which continue to be necessary in order to obtain the complete information required in the majority of cases. Nearly always it is desirable to know the character of the urine from the individual kidney and that can only be determined by ureteral catheterization through the cystoscope. Then too the intravenous pyelogram can not be depended upon for the detail required in making a diagnosis of such conditions as renal tuberculosis, kidney tumor, or epithelioma of the kidney pelvis. I say not depended upon, because unless there is obstruction to the outflow of the uroselectan or skiodan through the ureters there will not be the complete filling of the pelvis and calyces of the kidneys that is obtained by injecting through the ureteral catheter. Unless there is a stasis due to some obstructing factor the intravenous pyelogram is often a

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.



very sketchy affair.

For an adult 40 grams of uroselectan in 100 c. c. double distilled water or 20 grams of skiodan in 100 c. c. of double distilled water is injected usually into the median cephalic vein allowing 3 to 5 minutes for the injection. Several films are usually made about 20 minutes apart beginning 20 minutes after the injection but this of course can be varied to suit the individual case. Immediately after the injection has been made the patient may experience an unpleasant feeling of warmth associated with a flushing of the skin, perhaps some pain in the arm receiving the injection, and may even be slightly nauseated. These symptoms last but a few minutes and in my limited experience have been less likely to occur with skiodan than with uroselectan.

Apparently the only contraindication to the use of these substances is an extreme impairment of renal function plus severe damage to the liver for their elimination takes place through these organs, chiefly of course through the kidneys.

Intravenous urography seems to serve best in the following groups of cases:

1. Children about whose kidneys information might not otherwise be obtained. It is always an unpleasant task to have to cystoscope a small child and many times it is impossible to do so.

2. In bladder neck obstruction where catheterization of the ureters is impossible it is often desirable to obtain a knowledge of the upper urinary tract and intravenous urography makes this possible.

3. Where there is a shadow on the x-ray film that might or might not be a stone in the kidney or ureter an intravenous urogram will not only show whether the shadow is included in the urinary tract or not but it will give a good idea of the condition of the kidney itself, i. e., whether or not there has been dilatation above the stone or cortical destruction.

4. In those cases when for some reason such as stricture or anatomical obstruction a catheter can not be passed up a ureter or when there is so much inflammation the ureteral orifices can not be seen, intravenous urography is a friend in time of need.

5. In those fearful persons who are afraid of cystoscopy and will not submit to it, an intravenous urogram may be the means of either demonstrating a pathological condition or of ruling one out.

I have selected a few slides which illustrate very well just how useful intravenous urography can be in different cases:

No. 608. 1. A boy 17 years of age whose only symptom was pyuria. I cystoscoped him three times and was never able to get

a catheter up his right ureter. Urine from the left kidney was normal. The plain x-ray film showed two small shadows and two larger ring like shadows in the region of the right kidney and the intravenous pyelogram not only shows all these shadows but because of stasis due to ureteral stricture the typical deformity of tuberculosis at the end of the upper calyx is definitely brought out. This kidney was removed and found to be exactly as depicted by the pyelogram.

2. No. 175 was a woman in whose abdomen a mass could be felt and it was thought that this might be a hydronephrosis of the right kidney. For the reason that previous cystoscopy had been so painful she desired to avoid another. Intravenous urography demonstrated that the mass was not the kidney and illustrates, incidentally, how incompletely filled the pelvis and calyces will be in the absence of stasis.

3. No. 170. This was a man with a bladder tumor which obscured the ureteral orifices so that they could not be seen through the cystoscope. The first slide shows the dilatation of the right ureter, pelvis, and calyces from obstruction at the bladder and the second one shows how the left pyelogram was obtained only after putting the compression bag on the lower abdomen thus retarding the drainage of the medium through the ureter.

4. No. 145. This was a man who had had a cystitis for a long, long time but who would not be persuaded to submit to a complete cystoscopic examination. When, however, I made an intravenous urogram and was able to show him that he had a right hydronephrosis he readily submitted to cystoscopic treatment and by dilatation of the ureter I was able to relieve him of his condition.

5. No. 533. An extremely ill young woman with a large, tender mass in the left kidney region and marked tenderness over her right kidney. She was kept in the hospital for a long time and during that time she was cystoscoped several times. Her bladder was the foulest I have ever looked into and it was impossible to locate the ureteral orifices. An intravenous urogram was made showing an intensification of the shadow of the left renal mass and a dilatation of the right ureter, pelvis and calyces. Tuberculosis was suspected but could not be found in the bladder urine. In an attempt to do something for the patient a left nephrectomy was done under spinal anaesthesia and the kidney found to be a huge sac of pus with so little cortical tissue left that one wonders that it could still be functioning enough so that any intensification of the shadow was obtained.

6. No. 266. A woman who had had some not very severe pain in her left kidney region with typical distribution and urinary find-

ings plus a shadow that was thought to be a stone in the kidney. She was fearful of cystoscopy and so an intravenous urogram was made. This showed definitely the location of a stone in the upper ureter instead of in the kidney itself. This stone would not pass and was later removed surgically under spinal anesthesia.

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#### DISCUSSION

Virgil Simpson, Louisville: Mr. President and Gentlemen: It is utterly impossible to pay one's respects to the individual essayists and to consider the many interesting and valuable features presented by each.

One, I think, perhaps is as much interested in the practical application of such knowledge as the pathologists have arrived at as in any other single feature. It is true that so-called teleological studies are interesting largely because they show the how rather than the why. However, I think we are learning considerable of the how in managing renal conditions, somewhat because we have learned considerable about the pathology which underlies certain clinical pictures and are able, therefore, to correlate more or less accurately, the relationship which exists between the symptoms as they present themselves and the pathology as it is found post mortem.

One of the difficulties that arises as a consequence of trying to correlate pathological pictures post mortem with clinical features ante mortem is that, as suggested by the essayist, Dr. Maxwell, in considering the pathological types it so frequently happens that there is seen as a terminal picture a combination of many of the features commonly considered as essentially typical of each individual pathological group.

For example, in considering a kidney as it is presented post mortem, which had a predominance of symptoms, early at least, pertaining to the glomerular type of nephritis, the so-called infectious group, one finds as a pathological picture in its terminal results that not only are the evidences of infection present, not only is there damage to the glomeruli, but in addition to this, much degenerative change takes place in consequence of the primary glomerular pathology. Likewise, interstitial changes characteristic of the arteriosclerotic type, as well as the degenerative changes now considered essential in the nephritic group, are also found. So there will be this mixed picture, and there will be this lack of easy harmony between the clinical picture as you doctors see it and the pathological picture as you pathologists see it, but the more we study the two and the more

frequently we correlate and bring the two together, the clearer will be both clinical and pathological pictures with reference to what to do for these patients.

Then comes next, I think, a consideration of what is meant by renal insufficiency and what is meant by impaired renal function. At first blush you might think they mean one and the same thing, but they do not. I would like for you to think of renal insufficiency in the same sense that you think of cardiac insufficiency, that in renal insufficiency we have an inability on the part of the kidney to get rid of some one or all, in varying degrees, of the constituents which the kidney is supposed to get rid of. In the last analysis the chief function of the kidney is that of an excretory action. So far as we know it has no function with reference to action which would place it in the group or endocrine glands, though some of our biologic manufacturing houses would fain have us believe that such agencies as nephritin will restore kidneys to normal condition.

So then think of renal insufficiency in the same terms as you think of cardiac insufficiency; that in such conditions, regardless of what the pathological picture may be at the time of exitus there obtains a clinical grouping of manifestations of deficient function of the kidney so far as elimination of the protein substances, the salts, and so forth, is concerned, in contradistinction with impaired renal function which I would have you remember is a condition meant to convey the idea of a definite failure on the part of the kidney to **concentrate**.

In such a condition as failure of concentration, it is likewise of importance, clinically, to understand that a kidney that has an inability to concentrate the urine, as is determined by concentrations tests, very frequently has a compensatory exchange of function; that in a kidney in which there is impaired renal function, sometimes that same kidney can very efficiently compensate by getting rid of more water, which in terms of twenty-four hour output means elimination of more solid materials. Therefore, a kidney under such conditions may postpone the day of uremic advent very materially by virtue of an increased urinary output, a symptomatic polyuria.

In the third place, I should say that such study as has been presented to you this morning from the standpoint of pathologic and clinical groups of the nephritides must influence to no small degree our therapeutic attitude to this group of conditions. Take the nephroses, for example; the outstanding manifestation being a loss of albumin each twenty-four hours, therefore one of the most imperative needs in the therapeutic approach is the supplying of the wasted albumin. Here I want to say I have no quarrel with anybody's classification of the nephritides. What I am intensely interested in is **some** classification; in getting together and



thinking in terms of the same things. If our language becomes a common language, if when we are talking about nephroses we can all understand just what we mean by nephroses, if we understand that it is a degenerative type of thing, and if we can understand that in the arteriosclerotic type we are speaking of an entirely different pathological and clinical picture, I think we will have gone a long way toward clearing both the clinical as well as the therapeutic horizon. So in the application of methods of management to these conditions, I say I would not criticize anybody's classification, but I would like to see a sufficient amount of knowledge accumulated whereby some common consensus of opinion can be arrived at whereby we can all think in similar terms about the same sort of thing.

The Epstein high protein diet becomes a matter of consistency, a matter of confirmation to both the pathological conditions which we find post mortem as well as the need of the individual patient while still alive.

I am not quite so hopeless about the therapeutic management as perhaps some of you think Dr. Dowden is. I know quite well that he doesn't mean to convey quite that attitude of hopelessness which his words alone did convey to the audience. There is much that can be done for these conditions, and there is a great deal that can be done, not from drugs alone, but in the management of these conditions, taking them as individual problems. A great deal can be done with regard to living habits. Take the arteriosclerotic type, for example, with the hypertension that is incident thereto; whether it began as a primary arteriosclerosis of general blood vessels or whether it began as an involvement of the arterioles of the kidney itself, the habits though lifelong can be modified to the extent that the day of cardiac decomposition, retinal or cerebral hemorrhages, may be postponed. These patients oftentimes need not be required to stop, but rather to slow down; they may be taught the virtue of avoidance of extremes, the value of moderation, the wisdom of the admixture of play with work.

In short, I close with the admonition to the doctor that he has been too prone to rely on drug therapy and too indifferent to the benefit which may be derived from a new attitude toward the nephritic, an attitude that envisions him as an individual problem rather than a case record.

**E. Starr Judd**, Rochester, Minnesota: I have very much enjoyed hearing these papers. The first paper, on differential diagnosis, is particularly interesting, of course, to surgeons. Forty per cent of the renal tumor cases have hematuria, and yet not a large enough proportion of those cases are getting to the surgeon in time for surgery and at a time when surgery can help them.

The next two papers, the ones on pathological and clinical types, are particularly interesting because they take us back to the study of the fundamentals in this problem of renal conditions. We have gotten a little bit too far, I think, in our research in trying to progress in new things, and have overlooked a more profound knowledge of the fundamental renal conditions. By that I mean a more detailed study of the histology and pathology and an attempt to bring these different pathological conditions along in line with the clinical symptoms. We don't know enough about the physiology of the kidney.

Dr. Mann at the Clinic this year has been doing some work that is particularly interesting to me. He started out with the idea of seeing how much renal tissue was necessary to continue life and development. He took several litters of pups soon after they were born, and from one of the pups in the litter he would take out a kidney, from another he would take out half of one kidney, and still from another he would take out a kidney and a half, and he kept on until he took out all of the kidney tissue that he possibly could and still retain some with circulation and nerve supply to it. Then he turned these pups loose to see if he could recognize any change in the development of the dogs as they grew up.

The experiments are not yet completed, but I think from what we see in them at the present time we can say that an animal with any amount of kidney tissue, no matter how small it is, that has circulation and nerve supply to it will develop just as completely in every respect as a dog or an animal that has two normal kidneys.

I think that calls attention to the fact that the renal tissue will hypertrophy not only in substance but in function.

Another thing came out in this experiment. These dogs that had all of one kidney taken out, all but a little of the tissue, practically a quarter of one kidney, in three or four months at least, when that kidney was exposed again, it had returned not only to normal size but very much to normal shape, so the capacity for hypertrophy of renal function is almost unlimited.

I have a clinical case that is interesting in that respect. A woman came to me some years ago with a bilateral nephrolithiasis with infection in both kidneys, one kidney completely destroyed according to all tests that we could make. Our plan in those cases is to remove the worse kidney at the first operation, so I removed this shell of a kidney with stones in it and a considerable amount of infection, and allowed her to return home. She came back in two or three months to have the stones removed from the other kidney, which has been the best plan, in our experience. At the time of the second operation I found a good deal more infection in the kidney than I had expected; I

found the infection confined to the upper half of the kidney, and it seemed to me that by taking out at least a half of the remaining kidney I could do a better job than by taking the stones out and draining it. I did that, so that left her with a half of one kidney.

Her immediate reaction was not particularly difficult. She did have a rise in her blood urea. It went up to about 100 at the end of three or four days. It gradually came down again, and she made a complete recovery.

A year from that time she went through a normal pregnancy without any disturbance of her renal function at all.

I think, as the essayists have said, that the kidney tissue is right there and willing to and will hypertrophy and will take care of all the renal function that is necessary if we just give it part of a chance.

**S. C. McCoy:** Dr. Ray has given in the most concise manner an excellent paper upon this subject which is founded upon recent data of investigation and of incalculable value. He has presented this subject thoroughly, and impartial, and through discourse, and presentation of slides he has brought us to a point where we may decide as to the highest scientific and most practical procedure in studying diseases of the higher urinary tract by pyelographic method. He has in his bibliographic reference called your attention to the work done in proving the possibility and of the advantages of pyelographic study through the intravenous injection and excretion through the kidney tissue of certain chemicals, namely, uroselectan and skiadan.

Dr. Ray has so scientifically covered this subject that only the selection of method of cystoscopic examination and ureteral catheterization or the intravenous excretion method are before us for discussion. That my position may be clearly understood, I would like to state in the beginning that I welcome any method or procedure that will satisfactorily and safely reduce the number of cystoscopic examinations made. You have presented to you also the disadvantages of the cystoscopic method, that of obstruction either by vision or insertion of the instrument and catheter. Also the objection of its use in certain patients, also patients who refuse to be subjected to the cystoscopic examination. The latter in my experience in the great majority of patients is the result of lack of knowledge, as in any other operation, and usually based upon experience that is related by others, and not upon personal experience. However this has been greatly reduced in the last year during which time the Doctor has had more time to spend in explanation of the lack of pain and etc. accompanying the cystoscopic method. At this time it may be appropriate that I read a short report on the intravenous excretion method given by Dr. J. A. Riebel and Dr. Frank A. Riebel, Columbus, Ohio, Radiology, March, 1931.

Their report of "Fatal Results from Use of Uroselectan," reads as follows:

Inasmuch as the literature to date indicates that intravenous pyelography is a harmless procedure, we feel it timely to present a case in which we feel that its use contributed to the death of a patient.

A. C., a white male, age 53, was first seen by us on November 15, 1930. He gave a history of diabetes, and two months had had a series of furuncles. Apparently both the diabetes and the furuncles had received indifferent treatment. For the past two weeks he had been running a fever and had lost 20 pounds in weight.

Examination on the following day disclosed an obese white male, apparently quite ill. Temperature 104°; pulse 130; respiration 28. There was a large furuncle over the seventh left rib, and another over the right kidney. Palpation gave a sense of resistance over the latter area, although a mass could not be definitely outlined.

X-ray examination of the chest was negative. Roentgenograms of the kidneys revealed moderate uniform enlargement of the left kidney; the right one was not visualized. However, while the lateral margin of the left psoas muscle was well defined, that on the right was very faintly visualized and appeared compressed medially. The lumbar spine was flexed to the left; diagnosis of probable perinephritic abscess was made.

Cystoscopy was performed, but because of intense inflammation, the ureters could not be located. As we had administered uroselectan in three cases previously in our series without untoward effects, and as the diagnosis was still in some doubt, this procedure was thought to be indicated. We therefore, injected two-thirds of the normal dose of uroselectan at 2 p. m. Forty-five minutes later the patient had a severe chill, and the temperature rose to 105°; pulse 160; and weak. At the same time he became wholly incontinent. At 3 p. m. a roentgenogram disclosed the presence of little of the opaque drug in the bladder, but its concentration was insufficient to produce a pyelogram. A blood count showed: red blood cells, 4,510,000; white blood cells 18,475; hemoglobin 75 per cent. No urine was secured because of the incontinence. The patient lapsed into unconsciousness at 5 p. m. As it was feared that he would not react, he was operated upon at 7 p. m. An incision in the lumbar region over the right kidney disclosed an abscess containing two liters of thick pus, superficial to the muscles. A second incision released another liter from the region of the left midaxillary line. At 11 p. m. the temperature reached 107.8°, with no pulse. At 2 a. m. the patient died.

**Summary:** A case is reported in which the death of a patient, previously weakened by infection, was hastened by the use of uroselectan.



The case is interesting further in that the classical roentgenological signs of peri-nephritic abscess, lateral flexion of the lumbar spine, and unilateral effacement of the lateral margin of the psoas muscle, were simulated by an abscess located superficial to the muscular layers.

**W. T. Briggs, Lexington:** I enjoyed the symposium very much, especially the first and last papers. The others were somewhat out of my line.

In regard to intravenous urography, I had the pleasure of hearing Dr. von Lichtenberg last year, and seeing his pictures, and also the pictures of Dr. Keyes, Kretschmer and McCarthy. All of them had about the same difficulty that evidently Dr. Ray has had, that is, you do not get extra clear definition, and you can't understand it. Sometimes you get a clear definition when there is a blockage of the ureter, and sometimes you don't get a clear definition when you know there is good function in the kidney.

I had a case that had one kidney, and his PSP output was 60 per cent. I gave him uroselectan and none of the pictures showed anything except in his bladder. He had a stricture of the ureter of the remaining kidney which I tried repeatedly under caudal and once under spinal anesthesia to pass and could not do it. In a case like that you would think you would get an unusually clear definition because blockage from the ureteral stones or strictures usually cause a damming back and concentration of the solution, and you get a good definition.

In another case I catheterized one kidney, did a PSP test on him which was absolutely normal, the pyelogram was normal, and I was about to take out the kidney because it had a stricture of the ureter, and I couldn't get up it. The man was having lots of bladder symptoms, enough to make one think of tuberculosis of the kidney. We couldn't find any tubercle bacilli. I did the uroselectan test. The good kidney showed not at all, and the ureter didn't show, but on the side where I had contemplated removing the kidney he had a much better kidney than I thought he had, with very little dilatation and only slight dilatation of the ureter.

Since this has come into use, some men are advocating bilateral pyelography, which out West especially and in some other areas here and there has been common right along. I do not believe that bilateral pyelography will prove any safer with skiodan or uroselectan than it has with iodine or sodium bromide, both of which in the amounts used are more or less non-toxic, and I think that the fatalities that have happened in those cases have been largely due to an excessive reaction from the instrumentation, plus the injection in the pelves of the kidneys at the same time. There have been very few deaths from iodine.

**Edward H. Ray, (in closing):** I should like to say in defense of intravenous urography

that it has been used considerably for the last year and a half at the Mayo Clinic. I was up there recently, and Dr. Braasch told me that though they use it in many cases every day, they do not have reaction at all with skiodan, which is apparently far superior to the first substance that came out, uroselectan.

## SYMPOSIUM ON DIABETES

### DIETETIC PRINCIPLES\*

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The scope of this paper is sharply circumscribed by its title, for when we use the word "principle" we mean a general truth or proposition and in dealing with the "principles of dietetics," only the most fundamental aspects of the question can be considered. In 1869 when Mendeleev proposed the "periodic table of the elements," he stated that a fundamental conception only acquires significance provided it yields practical results: in elucidating hitherto unexplained phenomena, in disclosing unrecognized occurrences and in evoking verifiable predictions. It is believed that the principles of dietetics as applied to diabetes mellitus enunciated herein conform to these criteria. These principles are four in number: first, a diabetic must be given a sufficient number of calories, second, he must be given a sufficient amount of protein to keep him in nitrogen equilibrium, third, the total amount of his food expressed in terms of its glucose equivalent must be within his tolerance, and fourth, the relative amounts of carbohydrate protein and fat in his diet must be so adjusted that the fats will be completely oxidized.

With reference to the first principles: that a patient must be given a sufficient number of calories, this frequently resolves itself into simply watching his body weight from day to day or from week to week and making it conform to some predetermined figure. The patient's sensations of hunger or satiety are also consulted. The work of Lusk, DuBois and others has shown us that a patient at rest needs approximately 25 calories per day per kilogram of body weight, while one following the usual sedentary occupations of city life requires about 30 calories per kilogram. In other words an ambulant diabetic weighing 60 kilograms (132 pounds) will maintain his weight on 1,800 calories.

To give protein enough to maintain a patient in nitrogen equilibrium, it is necessary to give two-thirds of a gram for each kilogram of body weight if he be at rest in bed and one gram per kilogram if he be mildly active. Thus a diabetic who is "up and about" and weighs 60 kilograms, (132 pounds) would

\*Read before the Jefferson County Medical Society.

require 60 grams of protein. It is recalled that wide departures from this amount of protein are seemingly compatible with perfect health, but when comfort, efficiency and palatability of diet are considered in addition to health, this principle maintains its position.

The third principle: that the total amount of food (expressed in terms of its glucose equivalent) must be within the patient's tolerance, merits some discussion and needs some qualification. One of the most important concepts that has entered the medical mind in the present century is, that every diet no matter what may be its content of carbohydrate, protein and fat is equivalent, insofar as our sugar metabolizing mechanism is concerned, to a definite amount of pure glucose. This glucose equivalent is easily ascertained as it consists of all the carbohydrates, plus 58 per cent of the protein plus 10 per cent of the fat. The fact that 58 per cent of the protein is convertible into glucose is derived from experiments in which dogs are de-carbohydrated by the action of phloridzin and then given a pure protein diet. Such dogs excrete 58 grams of glucose for each 100 grams of protein eaten. That 10 per cent of fats is convertible into glucose is ascertained by simple arithmetic as it will be found that the molecular weight of glycerol (92) is one-tenth of the average molecular weights of fats, (palmitin, olein and stearin) after hydrolysis (914), and glycerol has been found to act the role of carbohydrate in metabolism. Every diabetic's tolerance for glucose (in this sense of the word) should be ascertained if possible, for by so doing we can classify him more accurately. For, instead of saying his diabetes is mild or severe or very severe, we can say he has a tolerance for a diet equivalent to 80, 90 or 100 grams of glucose.

In about one-fifth of the diabetics we see the tolerance is so low that no matter how we adjust the protein and fats, (within the limits of safety) we cannot give sufficient calories and still keep the glucose equivalent low enough. Before insulin was discovered, such individuals were confronted by two equally undesirable alternatives. They could take a diet within their tolerance and starve or they could take a sufficient number of calories and go into a coma. Whichever horn of the dilemma they laid hold of, the ultimate result was the same. So, although we try to keep the glucose equivalent of the diet below the patient's natural tolerance we are at times unable to do so and must artificially raise his tolerance. This we do with insulin, generally assuming that each unit of insulin will enable him to metabolize 2 grams more of glucose. Thus a satisfactory relationship

is again established between his maintainance diet and his new found tolerance.

If the relative amounts of carbohydrate, protein and fat in the metabolic mixtures are not adjusted properly; that is, if there is too much fat, some of the fat instead of proceeding to complete oxidation into carbon dioxide and water, will stop at some of the intermediary substances and cause acidosis. It has long been known that to insure the full oxidation of fats a certain quantity of carbohydrate must be undergoing oxidation simultaneously. This idea has been stated in picturesque language many times but such statements are, as Magnus Levy has said, "descriptive but not explanatory." No one knew how much carbohydrate had to be undergoing oxidation to insure the complete oxidation of any given quantity of fat until P. A. Shaffer found out in 1920. Shaffer used aceto-acetic acid as a typical ketone body and found that it was oxidized by hydrogen peroxide in an alkaline solution. When glucose was added to the mixture the oxidation was greatly accelerated, the aceto-acetic acid disappearing in a few hours, whereas without the glucose the reaction was quite slow. Allowing for the aceto-acetic acid oxidized by peroxide alone, it was found that the enhanced reaction due to the presence of glucose indicated that equimolecular quantities of aceto-acetic acid and glucose reacted with one another. Thus he was able to formulate in quantitative terms a familiar physiological phenomenon.

Woodyatt pointed out that inasmuch as the average molecular weight of the fatty acids is 270 and the molecular weight of glucose is 180, the complete destruction of fatty acids would be insured if diets were given which did not exceed this ratio of 270 of fatty acid to 180 of glucose. This is the now familiar fatty acid glucose ratio of 1.5 to 1 and put into simple language the chemical observation of Shaffer that acidosis would supervene if the ratio of ketogenic molecules to antiketogenic molecules in the diet was greater than 1 to 1.

We have seen in the discussion of the glucose equivalent of a diet that it consists of all the carbohydrate, 58 per cent of the protein and 10 per cent of the fat. Woodyatt has ascertained by an ingenious analysis of the chemical formulae involved, that the fatty acid equivalent of a diet consists of 46 per cent of the protein and 90 per cent of the fat. Therefore it has become a simple matter by the proper use of these figures to prescribe a diet in which the relative amounts of carbohydrate, protein and fat will be so adjusted that the fats will be completely oxidized, the patient will get the greatest possible number of calories compatible with his tolerance and acidosis will be avoided.



It has been offered as a criticism of the latter principle that when the ratio of fatty acids to glucose in a diet was greater than 1.5 to 1 not nearly as much of the ketone bodies were excreted as would be expected from the calculated excess. Shaffer has pointed out that when a large surplus of keto acid is not being formed it would be expected that some glucose molecules would be oxidized without encountering and reacting with keto acid and thus the ketolytic or anti-ketogenic action would not be employed, while in other localities there might be a deficit of glucose with consequent accumulation of keto acid. Such a condition exists, we may imagine near the threshold of acidosis and one might expect the amount of glucose necessary to prevent acidosis to vary. This expectation is borne out by the facts. Many patients will excrete ketone bodies on a metabolic mixture with a ratio of 1.5 to 1 while considerably higher ratios may be given without markedly increasing their excretion. As a rule, however, a fatty acid glucose ratio of 1.5 is the upper limit of safety and the higher the ratio above this the more pronounced the evidence of incomplete utilization of fats.

#### THE GENERAL MANAGEMENT OF THE DIABETIC\*

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Diabetes is a chronic disease, the treatment of which requires a program that is largely educational. The patient must be taken into the doctor's confidence, and the physician should be able to inspire co-operation and enthusiasm.

Let us assume that we have been visited by a patient, and having completed the history, physical examination and necessary laboratory studies, diagnosis of diabetes is made. At this time if the patient is one not requiring emergency treatment, it is well to acquaint him with the outline of your treatment. This does not mean to confuse him with a display of food charts, or a recital of grams and calories and the glories of insulin.

One of two plans should be suggested for his care. The first, and perhaps the better of the two, is the hospitalization plan which requires the patient to enter the hospital as soon as practical. The success of this plan depends greatly upon the intelligent co-operation of the hospital dietetic and nursing staff. Fortunately in this city there are a number of hospitals where this service is efficiently rendered. Assuming that our patient reports to the hospital as per our instructions, a fasting blood sugar determina-

tion can be made. The physician prescribes the diet he wishes the patient to have as well as such routine orders as saving the 24-hour specimens of urine to be examined for sugar and diaetic acid.

There is perhaps as great a diversity of opinion among dieticians regarding diabetic diets as there is among pediatricians regarding infant feeding. Fortunately the average diabetic adult will do well upon any restricted diet, and the honors appear equal as regards results obtained by advocates of the high fat and the high carbohydrate type of diet. I try to avoid either extreme and usually prescribe a maintenance diet which if there is no impairment of kidney function allows one or more grams of protein per kilogram of body weight and one and one-half to two grams of carbohydrate per kilogram. The fat does not exceed twice the carbohydrate plus half the protein. The diet of children requires a relatively greater amount of both carbohydrate and protein. The obese requires less fat, and the mal-nourished may be given extra calories in excess of his maintenance requirements. If there is no necessity to rapidly reduce the amount of blood sugar, the patient is permitted to remain on this diet for four days. At the end of this time if the patient does not have a sugar free urine or the blood sugar is not materially reduced, insulin may be given. The dosage may be one unit of insulin for each two grams of sugar appearing in the 24 hour urine, or perhaps better giving a small dose of insulin five to ten units to be increased gradually until a sugar free urine is obtained. This is the point where one should be on guard for insulin reactions, and the dosage of insulin may be reduced or the diet increased to care for such possibilities. Another practical method is to examine the patient's urine only prior to each meal, and insulin given in proportion to the amount of sugar found. Five units of insulin may be given if the Benedicts qualitative test turns green, ten units if the test turns yellow, and fifteen or more if the test turns red. No insulin need be given if the Benedicts solution is not reduced. This is an excellent plan for the patient to continue after he has left the hospital.

During the patient's stay in the hospital, he is taught to weigh and calculate his diet, to make simple urinary tests, and to inject insulin. He is provided with a diabetic manual, is taught the care of the feet, and first aid treatment of cuts and infections. He must know what to do for insulin reactions and how to care for himself until the physician arrives if acidosis is suspected. He is discharged from the hospital only when he, or the person to be in charge, shows sufficient familiarity with the routine to be safely

\*Read before the Jefferson County Medical Society.

left to his own responsibility.

Among the advantages of hospital care, in addition to the training rendered by dietitians and nurses are the following: The patient is relieved from routine cares and worries and is better able to concentrate upon the training he is to receive. The diet he received acquaints him with the type diet he must follow in the future and the material changes from his accustomed diet. The physician is given an opportunity to observe the patient and to carry out any additional x-ray or laboratory studies he may desire. Particular study of the cardio-vascular system should be made. If arterio-sclerosis is present, changes in the diet in an attempt to reduce blood cholesterol may be desirable.

The second method of training diabetic patients is the ambulatory method. The physician in his office may teach the patient to make a Benedict's test for sugar and a ferric chloride test for diacetic acid. The technique of sterilization of the syringe and the injection of insulin may likewise be taught. An accurate gram scales, a diabetic manual, graduated beakers and the necessary laboratory equipment are provided the patient or sent to his home. If possible, a dietitian or especially trained person may go to the patient's home and teach him to weigh and calculate his diet. If this is not practical the physician must also be dietitian, and nurse. The ambulatory patient rarely, however, becomes as efficient as those properly trained in a good hospital, and are more heir to bad advice of good friends, and the multiplicities of Quackeries. Dr. F. M. Allen, the well known diabetic specialist, recently said, "Often the patient may be blamed for disobeying instructions, but the ability and the facilities to train patients effectively are a part of a specialist's equipment. Many deaths may be counted unavoidable because of complications; with the present methods there should not be any deaths from uncomplicated diabetes."

The deaths due to arterio-sclerosis and gangrene in diabetics seem to have increased proportionately as their lives have been prolonged by modern treatment. Scrupulous care must be taken of the feet; corns and callouses should be removed only under strictest aseptic technique; it is unfortunate that many surgeons look with disdain on such simple work, and the patient's corns, together with his life, are intrusted to the hands of the chiropodist. Fortunately the care of the diabetic feet is beginning to be recognized and the better trained orthopedists are acquainted with the simple shoe corrections necessary, both in preventive and curative measures.

All infections both acute and chronic lowers a diabetics carbohydrate tolerance, and even the mildest diabetic may require massive doses of insulin to tide him over some acute respiratory infection. Every diabetic is a potential surgical patient. Abscesses call for immediate incision and drainage to prevent septicemia and death. The chronic gall bladder should be removed; likewise infected teeth and tonsils, and in fact all sources of focal infection whose eradication is feasible. Diabetic cataract may possibly be prevented by dietary treatment. The removal of cataracts in the diabetic is more likely to be followed by iritis if the blood sugar is not sufficiently controlled.

Regarding the arch fiend-diabetic gangrene. The treatment is of course preventive so far as that is possible. However, occlusions of blood vessels will occur in the diabetic as well as the non-diabetic. Conservative treatment should be tried for not more than eight weeks. If no improvement is noted in that time surgical intervention is necessary. Perhaps both surgeons as well as medical men are too conservative regarding amputation in diabetic gangrene. Until better methods are available high and early amputation offers the best prognosis in this most unfortunate of all diabetic complications.

Finally a definite follow-up program is necessary for the proper management of the diabetic. Usually if the diabetic's training has been sufficient, he should see his physician once a month, presenting a written record of his diet and general condition. If the questions he cares to ask the physician are likewise written, the more pertinent questions will be considered, and be dealt with more efficiently.

**Colloidal Lead in Treatment of Malignant Tumors.**—Dentici et al., on the basis of their trials, state that, while a favorably though transitory result may sometimes be secured with lead therapy, in its final effects saturnotherapy constitutes anything but a sure remedy in the treatment of malignant tumors. While in none of their patients was death referable to acute or chronic lead poisoning, the disadvantages of a toxicologic nature associated with the administration of colloidal lead for therapeutic purposes are unquestionable and sometimes require a prompt interruption of treatment in order not to hasten the death of the patient. The authors are very guarded in their evaluation of the results secured. Taking account of the peculiar anatomoclinical evolution of tumors, they hesitate to speak of stable improvements or of cures. Owing to the constant supervision of patients that is necessary, lead therapy may be employed only in thoroughly organized clinical and hospital institutes provided with well equipped laboratories.



## TREATMENT OF DIABETIC COMA\*

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Diabetic coma should not be considered a less serious condition even with the modern methods of treatment. It requires constant intelligent attention until the patient is out of danger. At the present time death should only occur from extreme exhaustion or intercurrent infection. The physician who undertakes to treat the condition must be prepared to remain with the patient, or at least in very close touch until recovery has occurred.

The production of diabetic acidosis must be understood. During metabolism acids are constantly being formed. The carbon present in proteins, fats and carbohydrates is mostly burned to carbonic acid; sulphur, contained in protein, is converted to sulphuric acid; phosphorus, derived from nucleoproteins and from lecithin, into phosphoric acid. Various organic acids arise during the intermediary metabolism such as fatty acids from fat and lactic acid from carbohydrates.

In spite of the constant formation of these acids the blood of normal individuals maintains a hydrogen ion concentration or P H of 7.4. The hydrogen ion concentration of the blood depends mainly upon the ratio of the concentration of carbonic acid to bicarbonate, expressed as an equation  $H=H_2CO_3$  over  $K Na H CO_3$ .

The neutrality of the blood is maintained by the buffer property of the blood and body fluids, the excretion of  $CO_2$  through the lungs and the excretion of acids and bases through the kidneys. Whenever excessive amounts of acids are retained the value of the ratio is increased, the compensatory mechanism comes into play but is never quite complete as long as the disturbing factor is active.

In uncontrolled diabetes the normal metabolism of glucose and fats is disturbed. The quantity of carbohydrate burned in the body is insufficient to insure the complete combustion of fats, ketone bodies being formed in large quantities. Every protective mechanism is brought into play. B-oxybutyric acid is replaced by the weaker carbonic acid which leaves the body easily through the lungs. A small part of the ketone bodies is volatilized through the lungs. The kidney by its selective ability excretes large amounts of B and oxybutyric acid, conserving the bases also by the production of ammonia.

When acid production overwhelms the protective mechanism the acid base equilibrium is disturbed and diabetic acidosis supervenes.

The degree of acidosis as determined by the  $CO_2$  combining power of the blood bears no relation to the degree of coma. Clinically, the condition varies from a drowsy or stuporous state to complete coma.

The treatment of diabetic acidosis should be directed primarily to the underlying condition, Insulin being the chief weapon. After the diagnosis is made and blood is obtained for laboratory tests Insulin should be given immediately. The amount of initial dose depends upon the depth of coma, the general appearance of the patient and the blood sugar level. 40 to 50 units may be given as the first dose. If the patient shows no improvement in one-half to one hour, this may be repeated. The frequency and amount of subsequent doses can be determined by the progress of the patient. If laboratory facilities are available repeated blood sugar examinations and estimation of the  $CO_2$  combining power will be extremely valuable in controlling the dosage. No patient should be allowed to die without having received 100 to 200 units of Insulin within two hours of death. There is no limitation in the amount of insulin that can be given providing enough glucose is administered to burn up the fats and to prevent hypoglycemia. It is better to give frequent small doses rather than large doses at long intervals since some of the Insulin may not be utilized. If the patient is in extremis insulin may be given intravenously but should be fortified by subcutaneous injection because its action is less transitory when slowly absorbed.

To obviate the necessity of frequent blood sugar determinations the examination of the urine specimens for sugar may be done before each injection of insulin. Care must be taken when catheterizing the patient to avoid producing an infection. If the patient has sufficiently improved it is better to obtain a voided specimen if possible.

It is not necessary to give glucose with the first few injections of insulin since the blood then contains an excess of sugar. However, as the blood sugar level approaches normal or the urine sugar lessens in amount the insulin administration should be accompanied by glucose intravenously or per rectum to supply carbohydrates to aid in the oxidation of the fats and prevent insulin shock. One and one-half to two grams of glucose should be given for each unit of insulin.

If laboratory and hospital facilities are not available the treatment of an acidotic patient can be controlled by repeated urinalysis for sugar and ketone bodies and by the general appearance and progress of the patient. This, however, entails greater strain upon the attending physician.

The general symptoms of dehydration, exhaustion and shock must be combated. The

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patient is considerably dehydrated because of the extreme loss of fluids due to excretion of large amounts of urine and to nausea and vomiting. The patient also as he becomes somnolent loses his desire for liquids. Measures must be actively instituted to overcome this condition. Saline can be given by proctoclysis or hypodermoclysis. The forcing of fluids not only overcomes the dehydration but also helps to protect the kidneys from damage and to aid in their elimination of ketone bodies.

Intravenous fluids must be reserved for special indications because there is danger of overloading a damaged heart. When the patient is overwhelmed with acidosis and other measures have failed to reduce the ketone bodies in the blood the intravenous infusion of glucose is of greater value in producing an excretion of the ketones than other methods of administering fluids. There is usually some kidney injury occurring during severe acidosis. This may progress to complete anuria. Intravenous fluids are then indicated to stimulate the kidneys to functioning. When intravenous infusion is instituted, care must be taken to admit the fluid very slowly to avoid circulatory collapse.

Exhaustion and shock must be combated by blankets, hot water bottles, warm drinks and retention enemas of coffee. Caffeine sodium benzoate and digitalis are of value in supporting the weakened cardiac musculature. Good nursing care is essential.

The patient has usually been vomiting before coma supervened so it is beneficial to lavage the stomach, taking care not to injure it in any way. This procedure will also relieve any gastric dilatation present and put the stomach in condition for the reception of fluids when indicated. There has been a stasis of the intestines also; therefore, an enema is indicated. Sodium bicarbonate may be given to aid in overcoming the acidosis. There is considerable dispute about this procedure. The majority of cases of acidosis will recover on insulin alone but soda may benefit a few. At the present time there is no proof that it is harmful.

A very careful physical examination should be made to determine any inciting complication or infection. If such are found they should be taken care of as soon as the condition of the patient permits.

After the patient has sufficiently recovered he is given a liquid diet of either milk (1000 cc) or orange juice with sufficient insulin to cover the glucose content. When the acidosis has been alleviated, he should be given an estimated diet and placed on regulated insulin dosage.

This paper would not be complete without discussing briefly the prevention of acidosis and coma. Coma results in the diabetic from

overeating, infections, injuries, hyperthyroidism and the omission of insulin. The diabetic patient should be warned of these inciting causes. He should be taught to force fluids, keep warm, rest in bed and to communicate with his physician for advice when he feels ill.

#### SURGICAL ASPECTS OF DIABETES\*

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There is no diseased condition requiring a more close association between the physician and the surgeon than diabetes. At no time has this co-operation been more imperative than at the present, since the scientific management of diabetes from the medical viewpoint has become such a complex development.

Few, if any, surgeons have the training and experience required to adequately care for diabetic patients. At one time the treatment was considered wholly one of diet, but now that it consists oftentimes of diet and insulin, diet is all the more a factor, and a complex one. So, in communities where there are men specially qualified to carry on the medical management of diabetes, no surgeon should fail to give his patient the benefit of this skilled attention. Fortunately for the surgeon and the patient, diabetics requiring surgery have usually had the care of competent medical clinicians before the surgeon sees them.

The advent of insulin in 1922 not only revolutionized the treatment of diabetics but also eliminated much of the surgical risk to which sufferers from the disease were exposed.

At the present time surgery in the presence of diabetes is not materially different, as to results, from surgery in the non-diabetic with similar age, habitus, and pathological hazards.

In considering the surgical problems presented by the disease it is well to look at them as belonging to two groups. In the first group are those surgical conditions which are not the result of a pre-existing diabetes, and in the second group are those which might be classed as true complications of diabetes.

Thus in the first group would come those diseases which are commonly met with in the 5th, 6th and 7th decades of life, in the obese, and in those leading an inactive life.

Nearly all the cases falling into the second group show the lack of resistance to infection so often present in the diabetic. The discovery and wide distribution of insulin has brought about a great change in the mortality following surgical intervention in diabetes.

\*Read before the Jefferson County Medical Society.



Prior to the use of insulin some of the best hospitals reported mortality rates varying from twelve to forty-five per cent. Now the mortality rate is about six or seven per cent in hospitals enjoying competent medical and surgical services.

Practically the only way in which the properly controlled diabetic patient differs from the non-diabetic one of similar age and physical condition is in his reaction to the presence of infection. This reaction to infection makes every operation in which this condition is a factor a serious procedure. The known fact that infection tends to increase acidosis demands a very close attention to the medical management of the case. Those cases requiring insulin will need an increased dosage when infection is present.

Second only to infection in importance in dealing surgically with the diabetic patient is the problem of the proper anaesthetic to be used.

Chloroform because of its pronounced effect on glycogen metabolism should never be used.

Ether—when one is forced to use this agent every effort should be made to minimize the quantity used. Ether even in the non-diabetic will cause some hyperglycaemia and acetonuria and it is expected that this effect will be more pronounced in one suffering from faulty carbohydrate metabolism. Since experiments have shown that the action of insulin is greatly inhibited by the presence of ether in the system it is imperative that the surgeon see to it that ether be given in the smallest quantities possible and for the shortest duration of time. In operating rooms properly equipped to care for the hazards of explosions, ethylene seems to be the best of the inhalation anaesthetics. This agent is more desirable than nitrous-oxide especially in abdominal work because of its power to produce greater relaxation and the fact that such saturation is not necessary as is the case when an attempt is made to cause muscle relaxation with nitrous-oxide oxygen. However, when there is an absence of ideal facilities for ethylene anaesthesia, nitrous-oxide oxygen is to be preferred to ether. Both ether and nitrous oxide oxygen often produce postoperative vomiting which in the diabetic is even more important than in the non-diabetic as this condition tends to produce dehydration and increase acidosis or alkalosis.

Local anaesthesia is to be preferred to inhalation anaesthesia when practical. It is well used when employed in conjunction with inhalation anaesthesia to lessen the quantity of such anaesthetics or to lessen the duration of their administration.

Local anaesthesia should not be employed in the region of infected tissues. Even in the normal individual it lessens the resistance

of the injected tissues, and this lowering of resistance is much more pronounced in inflamed tissues due to the presence of an excess of blood sugar.

The anaesthetic of choice in operations of any magnitude on the lower extremities is spinal anaesthesia. In fact this statement could be made about all operations below the diaphragm. Anaesthesia produced by the subarachnoid injection of novocain or allied drugs has become increasingly popular during the past few years and its advantages in the diabetic are even more pronounced than in the non-diabetic. The fact that it blocks the afferent nerve impulses thus lessening the degree of shock even in the presence of lowered blood pressure, and the minimum amount of nausea following its use, are features making it very attractive to those performing surgical operations upon diabetic subjects.

The most frequent condition requiring an abdominal operation in the presence of diabetes is disease of the gall bladder. Joslin found gall stones in 2.2% of 3,382 cases of diabetes. Wilder, in necropsies on 58 patients dying from diabetes found 16 cases of gall stones, and four cases of severe cholecystitis without stones.

Rabinovitch, from the statistics of the Montreal General Hospital found that gall bladder disease was nine times as common in the diabetic as it was in a similar group of non-diabetics. This last mentioned finding stimulates thought along lines as to etiological relationship between cholecystitis and diabetes. Cholecystitis is often associated with pancreatitis in the non-diabetic, yet in forty-eight proven cases of pancreatitis in Whipples clinic at the Presbyterian Hospital in New York, but three cases of diabetes resulted. In nineteen cases showing gross acute pancreatitis operated upon by Dr. Abell and his associates but one showed glycosuria and in that one a single specimen of urine showed .25% sugar.

As acute cholecystitis is rarely an emergency procedure save when rupture or gangrene is impending, the surgeon has ample time to prepare the patient, preferably with the aid of a competent internist, before instituting surgical measures to relieve the acute condition. The indications for operation are the same in the diabetic as in the non-diabetic since proper medical management can render the operation as safe in one as the other. Allen and Joslin have reported marked improvement in the diabetic condition following the clearing up of gall bladder disease.

Even today the surgeon sees many cases that have never had so much as an urinalysis. Thus the wisdom of all hospitals in requiring an urinalysis on all cases before operation is apparent.

In the presence of acute appendicitis or perforated peptic ulcer, operation should be performed immediately, preferably under spinal anaesthesia, and efforts made after operation to overcome the hyperglycemia and acidosis. Diabetes complicates about 1% of the cases of hyperthyroidism. Hyperthyroidism accentuates any diabetic condition, and thyroidectomy improves this condition. Following thyroidectomy insulin activity is increased and several writers warn those responsible for the medical care to be cautious in the use of insulin to prevent a hypoglycemia.

The diabetic patient and particularly those who have not been treated are peculiarly prone to skin and subcutaneous infections. This is probably due to the dryness of the skin which is deficient in sebaceous material rendering it easy for bacteria to gain entrance into the hair follicles and underlying fat. These boils and carbuncles require early drainage as they tend to spread very rapidly. Incision and drainage should be carried out immediately and then an effort made to control the diabetes by insulin and dietary measures.

The known diabetic should pains-takingly care for the skin especially that about the groins, buttocks and lower extremities for it is in these sites that the most severe infections are likely to occur. This care should consist of scrupulous cleanliness, the avoidance of irritating clothing, and the gentle rubbing of the dry skin with some non-irritating oil.

It is when gangrene is present with an accompanying glycosuria that the true diabetic complication is thought to exist, yet Buerger says "A study of the condition of the arteries and veins in limbs amputated for so-called diabetic gangrene reveals the fact that in each and every instance we are dealing not with a gangrenous process due to diabetes *per se*, but a mortifying process dependent upon extensive arterial disease."

McKittrick and Root classify as true diabetic gangrene those cases in whom infection has taken place, usually due to the streptococcus, with failure of infection to localize, and a tendency to lymphangitis, phlebitis, and even septicaemia. However, most of the cases of so-called diabetic gangrene are in reality arteriosclerotic gangrene, with the diabetes having some influence on the development of gangrene since statistics show that arteriosclerotic gangrene occurs about ten years earlier in the diabetic than it does in the non-diabetic. In Wilder's series of necropsies on diabetic patients over 40 years of age every one showed the presence of arteriosclerosis. The treatment of gangrene in the medically controlled diabetic does not materially differ from the treatment of gangrene in other individuals. The important point being to

secure free drainage and at the first sign of spreading of this infection to institute radical measures which in the case of gangrene of the extremities would be an amputation.

Conservative treatment of gangrene limited to the toes and metatarsal areas is sometimes the treatment of choice, even though the period of disability is quite prolonged, for in some instances return of function is secured. The economic status of the patient will sometimes be a determining factor in the choice of treatment, since the conservative measures often-times have to be followed by the radical ones, much saving of time and its consequent expense will be obtained by an early amputation.

When amputation is decided upon the point of election is, in the majority of instances, in the lower third of the thigh. It is preferable to use the Gritti-Stoke's technique as this operation provides a stump which can bear weight on the end. The outstanding feature of this operation is that in it the patella is reflected upward, its articular surface removed, and the resulting cut surface is attached to the stump of the femur which had been amputated slightly above the condyles.

In the presence of rapidly extending infections this type of operation is contraindicated and, desirable as it is, it must give way to the simpler circular incision operation which can be much more rapidly performed and which affords more free drainage of the incised tissues.

In closing I might make the apparently paradoxical statement that the surgical problems of diabetes are medical problems.

#### DISCUSSION

**Frank P. Strickler:** I have enjoyed very much indeed all the papers read in this Symposium on Diabetes and I feel that the subject has been covered in a very masterful manner. I do not think, however, that any surgeon should attempt to treat Diabetes from a medical standpoint. It is purely a problem for the internist and personally, I do not know of any surgeon who is competent to treat Diabetes medically. I further feel that all surgery on diabetic patients should be done only after due counsel has been taken with the internist and any surgery done should have the approval and indorsement of a very competent internist.

Most of the surgical diabetic cases that I have seen have been infections in the lower extremities and gangrene of the lower extremities. However, I recall two cases in which gangrene occurred in the upper extremities involving the fingers. I have also seen several very extensive carbuncles of the neck in diabetic cases. Infections in the lower extremities, generally speaking, should be treated from a surgical standpoint pretty much as any other type of infectious case. Regarding gangrene of the



lower extremities, once it is frankly developed it should be treated, in my opinion, by radical amputation and no extremity should ever be permitted to amputate itself as advocated, under the conservative treatment of gangrene, by some men. I believe that when we have a definite gangrene a high amputation should be done, preferably at the junction of the middle and lower third of the femur. However, if the patient is extremely ill it is probably safer to do a disarticulation at the knee joint. It is a well known fact that there is much less shock in a disarticulation through the knee joint. Then, later, if further surgery is indicated, it can be done when the patient's condition has improved.

In treatment of carbuncles of the neck I have used electrocoagulation. Thoroughly coagulating the entire carbuncle and over hanging edges of skin and curetting out all of the coagulated tissue. There is much less shock to this type of operation, the patient is more comfortable and the wound heals quickly.

Regarding anesthesia, I want to state that I do not believe that ether or chloroform should be used in diabetic cases. I prefer nitrous oxide and local infiltration of 1 per cent novocaine, well away from the area involved. I also use nerve block. I have never found it necessary to resort to spinal anesthesia for amputation of the lower extremities. Amputation in this region can easily be done by infiltration and blocking of the sciatic and anterior crural nerves and if it should be necessary, a small amount of nitrous-oxide can be given. Any amputation of the upper extremities can be done under brachial plexus block with one (1) per cent novocain. In cases of Diabetes complicated with focal infection in the abdomen, I prefer spinal anesthesia as it is a well established fact that the clearing up of gall bladder and pelvic infections materially assists the patient in combatting his Diabetes. However, abdominal operations in these cases should be done in close harmony with the opinion of the internist, as I do not think that these cases should be subjected to abdominal surgery unless there is a very definite possibility of improving the patient's general condition. Provided that a diabetic surgical case has been properly handled by the Internist and the surgeon sees these cases early, there is no particular reason why diabetic patients should run an excessively high mortality.

**Hays Gaillbreath:** When you look up the literature on diabetes mellitus, you are amazed at the amount of experimental work being done for the alleviation of this disease. Diabetes is an old disease. It was known centuries ago, but in spite of this fact there has been very little progress made in the discovery of a cure.

As far as the diagnosis of diabetes mellitus is concerned, since the middle of the nineteenth century when Fehling discovered how to detect sugar in the urine, the method of diagnosing this disease has been simple. At this time there is

very little excuse for one not being able to diagnose diabetes. All cases with sugar in the urine should be considered diabetic until proved otherwise.

As far as the hospitalization of diabetes is concerned, I believe it is much better to hospitalize a patient. There he can have regular blood and urine examinations made and a maintenance diet determined. However, if the symptoms are not severe, ambulatory treatment may be tried.

There is no known cure for diabetes, and all we have in the way of treatment is diet and insulin.

Pertaining to the diet, in reviewing the literature, it will be found that practically every physician has his own diet for the disease. Some use the starvation diet, some the high-fat, others the high-caloric and still others are more liberal with their carbohydrates. All have their reasons for giving a particular type of diet, and their reasoning seems logical; if we are able to prevent an acidosis, prevent glycosuria and can get the blood sugar down to practically a normal level, any of the diets should be satisfactory.

The complications of diabetes should be treated as they arise. If surgery is necessary, patient should be put in as good a condition as is possible. As muscle tissue requires a storage of glycogen, and it is very important that this food be furnished—it is often necessary to give glucose and insulin preoperatively.

In regard to the preferable type of anesthesia, everyone seems to be in accord. Local or regional, with or without nitrous-oxide-oxygen or ethylene-oxygen, is best; spinal can be used if the above do not suffice. Ether or chloroform should never be given.

Something should be said about the prophylactic treatment of the diabetic patient. Often an obese patient is seen with a high normal blood sugar and an occasional glycosuria. These are potential diabetics. These patients should be watched carefully and weight reduced by dietetic measures.

**Frank M. Stites:** The subject has been presented in a very commendable way and has been rather thoroughly covered. However, there is one fact that I believe is well worth mentioning; that is the renal threshold.

When a diabetic comes in for first observation, the first step in treatment is to remove sugar from the urine. It is important to determine this patient's renal threshold for sugar. We do this by placing patient on a weighed or restricted diet, at the same time making blood sugar determinations and urinalyses. This treatment is continued for several days and if the glycosuria disappears, then we make a blood sugar determination. If the glycosuria does not disappear on diet, insulin is given, until there is no glycosuria and the same determination made. The renal threshold remains the same

for a patient over a long period of time; however, there are certain conditions that cause this to vary. Patient may have an acute respiratory infection, or if there is a nephritis present the threshold is more apt to change and it is necessary to determine the new renal threshold. In view of this, we must continue on our reduced diet and increasing doses of insulin until our blood sugar reaches a level of normal.

I do not think I have ever heard a better symposium on diabetes, and I heartily commend the committee on the program given tonight.

**Woodford B. Troutman:** Dr. Hurst, in his paper on the treatment of diabetic coma, spoke of just one point regarding the vascular system, on which I would like to amplify.

We recognize two distinct and definite types of coma in diabetics; first the true acidotic type and secondly the vascular type. I feel that all cases of the first type, under proper management and with the necessary amounts of insulin, should recover. However, in the second, or vascular type, even though they may be rendered sugar free, many of these cases go right on to the fatal outcome—the result of circulatory failure.

One point that may be of general interest, which is more statistics, is that someone (I know not who) has gone to the trouble of estimating the diet among peoples of all nations and has found that it averages as follows: carbohydrates 60 per cent, protein 20 per cent, fat 20 per cent. Now as we go along we find that in the better classes more and more fats and proteins are substituted for the carbohydrates; therefore, this may give us a lead as to why we see more diabetics among the middle and upper classes.

I have recently learned that in the treatment of diabetics, more carbohydrates can be allowed than I had been formerly taught. The important point is to give enough insulin to make up for any amount of sugar given. As we continue treatment, less and less insulin is required; this is apparently due to the fact that the islands of Langerhan seem to be stimulated, or we might say reactivated, and the patient can therefore take care of more carbohydrates in a natural way.

**J. Duffy Hancock:** Dr. Henry has given us a most thorough summary of the present day treatment of surgical diabetes.

I want to emphasize one point which he brought out in regard to the conservative treatment of certain lesions of the lower extremities. The conservative treatment should be limited to those lesions primarily of the infectious type. Most of the lesions occur due to circulatory disturbances, but some to infection primarily. We must first then differentiate these two types of lesions, and use the conservative treatment only for those primarily due to infection.

In regard to history, if the pain is not out of proportion to the extent of the lesion, the chances are that the lesion is more likely pri-

marily due to infection rather than circulatory disturbance. If the pain is considerably greater, then lesion is no doubt due to circulatory impairment. If it is of the infectious type there is often a history of pains in the leg followed by periods of relief, indicating the establishment of an adequate collateral circulation.

As far as the examination of the leg itself is concerned, there are several points to note. Ordinarily the foot is a little cooler than the thigh. If there is not too great a difference in the temperature of the two parts and if there is no definite level where there is a sudden change, the chances are that the circulation is fairly adequate in that leg. The palpation of the dorsalis pedis artery, if it can be palpated although feebly, shows a fair degree of circulation. If the foot after being elevated and lowered rather rapidly assumes its original color when placed at body level, it is indicative then that the circulation is rather satisfactory.

Such cases as this should receive the conservative treatment. The primary incisions should be long enough to avoid future pus-pocket formation and the planning of the incisions should be such as to avoid injuring any blood vessels which are functioning.

Infiltration anesthesia at the site of the lesion and the use of a tourniquet, should be avoided. If gangrene is extensive or if there is a relatively small amount of gangrene present but the temperature is over 100° F., (indicating the probability of beginning septicemia) the radical amputation at lower part of thigh should be done. The same is true if the patient is exhausted physically, or as Dr. Henry mentioned exhausted economically, since the period of convalescence will be much shorter with the radical operation.

**Frederick G. Speidel,** (in closing): In closing, I should like to mention the advisability of administering sodium bicarbonate in the treatment of diabetic coma.

This seems a small matter, yet pages upon pages of medical literature are covered with this question as to whether insulin alone is sufficient and whether soda is also necessary. When we recall that carbon dioxide is manufactured in the tissues and is brought to the lungs in solution in the plasma, combining with the sodium carbonate, it gives us a better appreciation of the subject. We have sodium carbonate in solution in the plasma and this takes up the carbon dioxide, forming sodium bicarbonate. If we produce an acidosis with hydrochloric acid, the acid will be neutralized by the alkali in the blood; that is, the sodium will combine with the chlorine and form sodium chloride. Naturally, when sodium chloride goes to the lungs, it can not give up its chlorine as happens when sodium bicarbonate goes to the lungs and gives up its carbon dioxide. The result is that this sodium chloride is eliminated by the kidneys, the ultimate result as far as our bodies



are concerned being that we have lost some sodium. When we measure the carbon dioxide carrying capacity of the blood with Van Slyke's apparatus, we measure how much carbon dioxide the blood can take up by virtue of the sodium carbonate present. In other words, we indirectly measure the amount of sodium present. So no matter how much of the acetone bodies we succeed in burning up with glucose and insulin, we still must replace the sodium which has been lost in the neutralization of the acids. Thus it will be apparent that the administration of sodium bicarbonate is a rational and valuable adjunct to insulin in the treatment of diabetic coma.

**Armand E. Cohen**, (in closing): As a member of the symposium, I wish to thank you for your excellent discussion.

Mention has been made of the tendency in recent years to increase the carbohydrate in the diabetic diet. This tendency is quite apparent and some, as Sansum, in California, go so far as to prescribe a normal diet, covering the excess carbohydrate with the liberal use of insulin. On the other hand, Marsh, at the University of Michigan, continues to use a high fat diet and apparently finds the advantage in doing so, in that a smaller and most constant dosage of insulin is possible and the fluctuation in the blood sugar level is less.

Regarding the conservative treatment of gangrene, it will be interesting to learn what part cholesterol plays in causing arterio-sclerosis, the predecessor of that terrible malady. Diabetics treated with a well controlled diet do not develop a hypercholesteremia.

**Dr. Samuels**, of the Mount Siani Hospital, New York, is an advocate of conservative treatment of gangrene. He advocates absolute rest in bed, intravenous saline, and permitting the part to amputate itself. I have followed his treatment in two cases with very little success. If, after six to eight weeks of conservative treatment, the patient does not show any response, a mid thigh amputation is indicated. Pain per se is not an indication for amputation as these cases can often be relieved by nerve block. Another simple procedure is the utilization of the saline test, also the vaso-motor test utilizing spinal anesthesia, and typhoid injections.

**A. T. Hurst**, (in closing): I have enjoyed the papers presented by the other physicians in this symposium. I appreciated Dr. Speidel's elaboration of the subject of sodium bicarbonate medication.

We must always remember that in treating diabetics we are treating human beings who are subject to various whims and tastes. Their diet should be made to satisfy these variations as much as possible to prevent the patient from breaking away from the diet. Any one of you who has ever attempted to follow a restricted

diet can realize how difficult this can become at times. Therefore, they must be encouraged as much as possible and taught to treat themselves. They should learn to figure their own diet for the day using what foods they desire, only being restricted to the total amount of carbohydrate, protein and fat designated by the advisory physician. The great majority of these patients are intelligent and readily learn to do this.

No matter whether the treatment instituted for the diabetic is ambulatory or hospital in type it is expensive and prolonged. Therefore, it is up to us as physicians to try to conserve the patient's resources. This can be done much better by using the ambulatory method and avoiding the added expense of hospitalization. The majority of patients can be easily handled in this way. Of course there are some few cases that require hospitalization.

As physicians we obtain a great deal of pleasure in satisfactorily controlling a diabetic patient.

#### A CASE OF OCULOGLANDULAR TULAREMIA, WITH BILATERAL OPTIC NEURITIS, RESULTING IN COMPLETE BLINDNESS\*

GEORGE F. DOYLE, M. D., F. A. C. S.  
Winchester.

While a number of cases of the oculoglandular form of tularemia have been reported, as far as I have been able to discover from a careful search of the literature, the following case is the first on record showing involvement of the optic nerve.

**J. E. C.**, female, white, aged 61 years, consulted me on February 26, 1931, giving the following history:

**Past History:** Has had intermittent vertigo for ten years, and tinnitus aurium for the past two years. Has suffered from headache for several years. States that she has had muscular rheumatism for seven years, affecting both shoulders and knees. There was no history of previous eye trouble.

**Present Complaint:** On September 29, 1930, while dressing a rabbit, which had been killed on the road by being run over by an automobile in which she was riding, she cut the index finger of left hand at the outer side of the distal phalanx. She also rubbed both eyes after handling the rabbit and before washing her hands. On October 1st, she had a severe chill, developed high fever, the temperature reaching 105 F., severe headache, nausea and vomiting. The fever continued for a period of four days, raging between 104 and 105 F., during which time she was delirious. On October 3rd, the site of

\*Read before the Clark County Medical Society.

the injury on the index finger became red and swollen and in the course of a few days a deep ulcer appeared. At the same time the axillary glands of both sides, as well as the glands of the left arm and forearm, became greatly swollen and extremely tender. The axillary glands became as large as a hen's egg. The preauricular, submandibular and cervical glands of both sides became greatly enlarged and very painful. Subsequently, one of the glands on the anterior surface of the left forearm, close to the elbow joint, proceeded to suppuration. Both the ulcer on the index finger and the abscess at the elbow joint were very slow in healing. At times during the course of the disease there was a macular eruption on the face and body.

On October 4th, almost simultaneous with the appearance of the ulcer on the finger and the glandular enlargement, the left eye became inflamed and very painful. The lids were greatly swollen and edematous, and there was a profuse muco-purulent discharge. At the same time she noticed marked impairment of vision in the left eye, accompanied by flashes of light, which annoyed her to such an extent that she had to keep the eye covered. The following day, the right eye also became involved in the same manner. At first the vision was hazy, the patient describing it as if she were looking through a cloud of smoke. She could distinguish objects and recognize faces inside the house, but when taken outside she could hardly see at all. The impairment of vision gradually increased until at the end of eight weeks she was totally blind in both eyes. The swelling of the lids and muco-purulent discharge continued for a period of five weeks, when they gradually began to subside. During all this time she continued to have severe headache and this had continued until the present time, but is now less severe and intermittent in character. She still complained of occasional pain in the eyes. She also complained of pain and weakness in the left shoulder, arm and hand.

**Physical Examination:** The patient was a well nourished, though somewhat anemic, adult female. Temperature 98.6 F.; pulse 100; respiration 18. The lungs were normal. The heart showed a very short and very faint systolic murmur, which was not transmitted. Blood pressure showed systolic 158, diastolic 90. Abdominal viscera normal. There was a small, slightly depressed scar on the outer side of the distal phalanx of the left index finger, and a similar scar on the internal surface of the left forearm near the elbow joint. There was no glandular enlargement, with the exception of multiple, small subcutaneous nodules on both the anterior and posterior surfaces of the left arm and forearm. The left arm showed some muscular weakness, but she was able to move it freely in all directions.

**Urinalysis:** Clear; yellow; no sediment; 1,024; strongly acid; no albumin; no sugar; amorphous urates; few leukocytes; an occasional squamous epithelial cell; no crystals; no casts.

**Blood Examination:** Hemoglobin, 70%; red cells, 3,560,000; white cells, 8,200. Differential: Polynuclear neutrophils, 61%; lymphocytes, 38%; basophiles, 1%. Wassermann negative. The agglutination test for *Bacterium tularensis* was positive in dilutions of 1:320.

**Ear, Nose and Throat Examination:** Both ears showed slight retraction of the membrana tympani, but otherwise were normal. There was a deflection of the nasal septum to the left, with some obstruction. The nasal, nasopharyngeal and pharyngeal mucosa showed a mild catarrhal inflammation. The tonsils were small and showed no evidence of disease. The larynx was normal. Transillumination showed the frontal sinuses, ethmoid cells and antra of Highmore perfectly clear. X-ray films showed all of the accessory sinuses normal, and no evidence of any intracranial lesion.

#### Hearing Tests:

A. D.	A. 1	A. 6	Ac)	Be	==	N.	C4	good	Weber	+	Pol.	—
A. S.	Galton	0.4	1	6	Ac)	Be	==	N.	good	—	—	—
			0.4									

**Eye Examination:** There was complete blindness in both eyes, as there was no perception of light. The eyes were straight, and the motility was normal. The tension in both eyes was plus. There was slight orbital tenderness upon deep pressure upon the eyeballs. There was moderate congestion of the tarsal conjunctiva of both eyes, with decided thickening in the retrotarsal folds. Upon evertting the lower lids, the congested conjunctiva showed a number of small yellowish areas, which were probably the scars left by previously existing ulcers. The bulbar conjunctiva of both eyes was slightly congested. The cornea of each eye was clear, the anterior chamber normal in depth and the aqueous clear. There was no anesthesia of the cornea of either eye. The pupils were widely dilated and the iris was immobile. There was no discoloration nor apparent atrophy of the iris. The lacrimal apparatus of both eyes was normal.

The ophthalmoscopic examination showed both eyes the same. The media were clear. The optic disc was round, decidedly prominent, grayish-white in color, and the margins were irregular and slightly blurred. The small vessels of the papilla were partially obscured by exudate. The retina showed slight haziness around the disc, the arteries were somewhat diminished in calibre and there was thickening of the perivascular lymph sheaths. There was no evidence of hemorrhage into the retina, nor were any areas of degeneration discerned. The op-



thalmoscopic picture was that of papilledema which was beginning to pass into the stage of post-papillitic atrophy.

The condition progressed to complete atrophy of both optic nerves, and when last seen the optic disc was round, with irregular margins, perfectly flat, chalky white in color and the small vessels of the papilla had entirely disappeared. The retinal vessels were markedly contracted with streaks of light accompanying them.

### THE SYNDROMES OF CHRONIC EPI- DEMIC ENCEPHALITIS\*

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Louisville.

The pathology in chronic encephalitis is degeneration and inflammation as found in the acute stage. Hence, the objection to the term *sequelae*. Many believe this disease to be a chronic progressive process. Nearly all of those cases presenting symptoms do grow worse, some not so rapid as others. One adult seen in 1920 with tremor and rigidity is not so much worse off today. In those cases remaining more or less stationary are evidently suffering from the effects of the acute attack instead of chronic encephalitis. As in syphilis of the nervous system, the symptoms are multiple and vary according to the particular portion of the central nervous system involved, therefore, syndromes are hard to describe.

The time at which symptoms of the chronic type appear vary. Some observers have noted them along with, and immediately following the acute attack, however, the larger per cent show signs three or four years after apparently recovering from the acute attack. Often the typical picture is seen without any history of an acute illness or the symptoms were so slight they passed unnoticed. One adult had double vision for only a few hours, and then later developed the typical Parkinsonian syndrome.

We are confronted with a disease which limits its process to the cerebrospinal system, consequently the presenting symptoms are cerebral, cerebellar or spinal.

On account of the frequency of this disease attacking the mid-brain, an area least understood, it is difficult to say whether the symptoms arise from loss of function of this particular area or whether they arise from a release or lack of control of other portions of the brain.

The most common symptoms are those found with the Parkinsonian syndrome, eye symptoms, choreiform, myoclonic movements, mental symptoms and sleep disorders.

The Parkinsonian syndrome is typical of this disease. It is a clinical picture resembling paralysis agitans or Parkinson's disease. It usually begins in one arm, slight rigidity or stiffness, or it might be a slight tremor. The patient notices some difficulty in using his hand. The position of the arm attracts attention, the elbow is flexed, fingers usually extended and the arm is held to the body. These symptoms increase and the arm movements become slow. In the course of months the leg becomes involved, presenting an atypical hemiplegic gait. These symptoms may remain on one side for a variable length of time, when the other arm and leg show the same signs, usually one side is more severely affected than the other. The face shows the typical lack of expression, masked face, speech is slow, with difficulty of the lip sounds. The neck muscles may be involved, leading to difficulty in swallowing.

In the advanced or of long duration there may appear attacks of disturbance of the associated eye movements, in looking to one side the eyes become fixed, the most common disorder is an upward movement of the eyes. The eye lids may close. During these attacks the patient has no control for the time. They cannot right the eyes at all. The attacks last from a few minutes to hours. These manifestations are termed *oculogyries*. Increase of saliva is a common and annoying symptom. The skin may become very oily, and show acne. These patients are always so tired and weak and want to keep quiet. They will sit or lounge on the bed for hours without moving.

As the process advances their gait becomes that of a paralysis agitans, slow, shuffled, short steps, losing the swing of the arms. There is a tendency to flexion of the knees, elbows and bending forward of the spine. These patients eat and sleep and maintain their nutrition, often inclined to obesity. The physical examination may be disappointing. General physical signs are lacking. There are no heart, lung, and kidney symptoms, unless from some complication—they are not associated with this disease. The neurological signs are often very few. The pupils show the most consistent change. Loss of accommodation is most common, sometimes even loss of light reflex, less frequent an inequality of the pupil. Few show squint, and nystagmoid movements, others cranial nerves escape injury. The deep reflexes are lively without a Babinski or typical clonus. If the pyramidal tracts are involved a Babinski may be present.

The abdominal reflex is often absent or unequal. Bladder and rectal reflex not changed, no sensory, no paralysis or atrophy. The striking symptom is the rigidity, stiffness of all of the muscles. It is not spasticity

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

as seen in pyramidal tract lesions which affects principally the flexor muscles. The patient seems unable to use his muscles, but on a quick effort the motion is very good. They walk very slow, but can run or jump very well.

This picture is typical and when once seen you can appreciate the statement that the diagnosis is made from what you see more than from the finding on physical examination.

Frequently we see these symptoms remain in one arm, one arm and leg. In some the tremor is more pronounced than in others, but all show the rigidity beginning early and increasing. The tremor is not the "pill rolling" as seen in paralysis agitans, often it occurs on motion and at rest, again the fingers are most likely to be extended rather than flexed.

As an illustration how these vary in their onset, recently an adult reported on account of his hand and arm. His hand is closed and he opens it with difficulty, the elbow is flexed and arm is held to the body. This man is a railroad brakeman and does not hesitate to grasp the handle bars on a moving train. On quick movement he opens his hand perfectly. Some four or five years ago he had a peculiar illness, which confused his father, a physician.

You may ask what percentage suffer from this syndrome. The mortality of the acute cases is approximately twenty-five per cent, approximately twenty per cent recover without symptoms. Of those recovering from the acute attack forty to fifty per cent will show symptoms of the Parkinsonian syndrome.

Another interesting syndrome are those who suffer from choriform myoclonic movements and ties, a quick incoordinate movement limited to one arm, leg or both arms and legs. In walking these patients will jerk the leg forward or backward, causing a very peculiar gait. These spasmodic movements may occur in the diaphragm, chest, or facial muscles, in fact in any muscle. Rapid, slow and irregular breathing may result. These manifestations, as a rule, are not seen in the Parkinsonian syndrome, which is characterized by "poverty of motion."

About ninety per cent show sleep disorders, as insomnia, lethargy, and inversion of sleep, that is, sleep during the day and awake at night. In the acute attacks many get but little sleep, even with hypnotics, and these are the cases who usually suffer from insomnia or inversion.

Those who have lethargy in the acute attack can doze at any time. Those with inversion of sleep are very annoying to the other members of the home. A boy would start his pranks, throwing pillows, running from room to room, whistle, talk, restless and

alert when others wanted to sleep. About four or five a. m. he would go to sleep.

In the past few years a great deal has been written about narcolepsy. There is no doubt about the increase in the number of cases. Many have followed an acute attack of encephalitis. These cases resemble idiopathic narcolepsy, even presenting the cataleptic symptoms.

The internal secreting glands have been studied and hyper and hypo-functions have been reported, but to say they are connected with encephalitis more than any other debilitating state is a question. One syndrome which resembles hypopituitary increased weight and polyuria is very interesting. Many of these patients have a tendency to increase in weight, become fat, but no particular glandular deficiency has been found at fault.

Alteration of reflexes, motion and sensation are lacking in most cases. The clinical picture in chronic encephalitis is spoken of as an extra pyramidal or mid-brain syndrome. It does not, as a rule, attack the pyramidal tracts, hence, absence of reflex and motor defects. However, there is a disturbance of the tone of the general muscular system which causes the symptoms of rigidity, poverty of motion, and hyper-mobility states. These are accounted for by the pathology found in the basal ganglia.

Comparatively few cases have shown organic nervous syndromes, anaesthesia has occasionally been found in the area of the fifth nerve. A clinical picture resembling any trophic lateral sclerosis has been described. Recent studies indicate a disturbance of vibratory sense.

Small hemorrhages may occur and lead to hemiplegia, but this is the exception and not the rule.

Whether chronic encephalitis is an etiological factor in other organic nervous diseases is speculative. Epileptic convulsions have been attributed to it, but as epilepsy is so frequently noted following any infection it is a question whether it is a particular individual and not a particular virus, however, it is worthy of consideration.

Very few present painful conditions—facial neuralgia has been mentioned, a cramp-like pain in the foot after walking has been seen.

Many of those of long standing have aches, possibly from position and fatigue, it may be of cerebral origin, they want to get up and walk or move. In the terminal stages this aching pain is most distressing.

Cerebellar and eighth nerve syndromes have been reported.

About twenty per cent show some form of mental symptoms. These patients are beginning to require institutional treatment. In some states more patients are admitted



as psychoses with chronic encephalitis than others. There is no special mental picture that is characteristic. Age determines the type more than anything else.

In children it is a question of behavior, while in adults it may be behavior, impulsive compulsions, depression, confusion, dementia praecox and paranoia.

Bromberg-Manhattan State Hospital in a study of 135 cases classified them as follows:

Behavior problems	70
Affective disorders	27
Paranoia conditions	13
Dementia Praecox	9
Intellectual enfeeblement	2
Hallucinatory states	1
Impulses	1
Compulsions	1

In adults the larger number show behavior problems, noted in sexual perversion, impulsiveness.

Recently a young man who had encephalitis some ten years ago was placed in an institution because of attempts to kill his parents. The patient is a typical Parkinsonian, not mentally weak, but has these periods of temper tantrums.

From their lack of expression, interest and energy, just sit and gaze, would lead one to believe they were mentally weak, but they are not. A man with a responsible position was a pitiable sight to look at, but he was able to hold his position for several years.

The children with behavior problems are not of the lethargic type. These children are restless, hyperactive, move around without an objective, cough, sniff, and whistle. They tell stories, etc., serap with playmates, etc., etc.

As they grow older they become more troublesome. All these symptom groups tend to progress, regardless of treatment they grow worse. All have a tendency to show the rigidity in later stages. Those beginning with rapid breathing, oculogyries, some with choreiform movements have been seen to terminate in Parkinsonian syndromes. In the terminal stage they are almost helpless, confined to bed, swallowing becomes more difficult, sleep is broken. Exhaustion and inanition is the greatest factor in the cause of death.

#### DISCUSSION

W. E. Gardner, Louisville: Dr. Moren's paper has been most interesting, as all of his papers usually are, and I have been particularly interested in following his discussions of encephalitis for the past several years. I think Dr. Moren has had more than an average interest in the manifestations of this disease, especially in the syndromes of the chronic type. They tax one's patience, and any thing that offers even

partial relief is worthy of our most favorable consideration.

The type of rigidity in the Parkinsonian manifestation referred to by Dr. Moren seems to be one of extra-pyramidal rigidity, which is due to lesions essentially outside of the motor pathway, including the motor cortex, internal capsule, crus cerebri and crossed pyramidal tracts of the cord. Here we have, as Dr. Moren intimated, possibly an overactivity of the extra-pyramidal system which becomes released from cortical control not because of any lesion in the pyramidal system itself, but on account of diseased processes in the extra-pyramidal system about the basal ganglia, the corpus striatum, and other portions of the midbrain.

It has been held recently by some students of this disease who have done extensive autopsy investigations in a great many cases, that there is involvement of the hypothalamic area, or the tuber cinereum, also in some instances perhaps involvement of the pituitary body, which was referred to by Dr. Moren in touching upon the possibility of changes in some of the glands of internal secretion. Degenerative areas, evidence of hemorrhages, and other changes, are sometimes found in these areas, especially the hypothalamic region as well as the substantia nigra, which latter is said to be the most common site of the degenerative process.

There is a tendency toward flexion rigidity that we see in other types of Parkinsonian manifestations, even in pre-senile Parkinson's disease. We sometimes see this same tendency to flexion rigidity in chronic epilepsy. In most of these types of extra-pyramidal rigidity it is interesting to note the beneficial effects of hyoscin, stramonium, and even belladonna in some cases; at any rate, all of these included in the belladonna group.

Dr. Moren did not go into the question of treatment of encephalitis of the chronic types. I know at this time however he is very enthusiastic about the use of stramonium, as a great many other men have been as shown in the recent literature, especially within the past two or three years. For a number of years it has been known that the use of hyoscin was beneficial in pre-senile Parkinson's disease, or the old cases of paralysis agitans, and for this reason hyoscin was the first drug of the belladonna group used in the treatment of the post-encephalitic parkinsonism. It is remarkable how beautifully in a certain small percentage of cases there is response to the use of hyoscin in large doses, as well as to stramonium. It is also surprising what large doses of these drugs can be tolerated. There is something about the stiffness and rigidity of these individuals that seems to neutralize the toxic effect of these drugs. The average dose that would be toxic to any one of us, perhaps, has little or no effect upon the case of parkinsonism. Not infrequently we use as much as eight, ten or twelve hun-

dredths of hyoscin a day in the treatment of these cases of post-encephalitic parkinsonism. Dr. Moren gives perhaps as much as 60 or 90 minims of the tincture of stramonium. I know he gives as much as eight or ten grains of stramonium leaves in some cases. If any beneficial effects are to be expected, it is necessary that the drug be gradually stepped up to full doses, and I am convinced that it helps to control the unrestrained activity of the extra-pyramidal system.

In pyramidal lesions the belladonna group of drugs has no effect, sometimes may perhaps do harm, even in moderate doses. In cases, for instance, of old hemiplegia, due to lesion of the internal capsule, such as hemorrhage or thrombosis, one gets no beneficial effects from the belladonna group.

Time will not permit me to discuss the behavior disorders in children, and other chronic manifestations of encephalitis, referred to by Dr. Moren, but I am particularly pleased to have had the opportunity to hear his paper. I am sure it has been of immense value to all of us.

**C. D. Townes, Louisville:** Encephalitis is interesting to ophthalmologists because eye symptoms occur with great frequency in the course of the disease. It is extremely doubtful whether encephalitis ever runs its course without at sometimes showing eye symptoms. So frequent are the eye symptoms that infectious ophthalmoplegia or toxic ophthalmoplegia are among the names applied to this disease.

Chief among these eye symptoms is paralytic involvement of the ocular muscles. Those of the third nerve group are most often affected. In the acute stages of the disease these paralyzes may be evanescent, intermittent, giving rise to fleeting, diplopias and disturbances of the eye movement. Ptosis is also a frequent symptom.

While these paralyzes occur more frequently in the acute stages, and are fleeting and evanescent, they may also be among the last symptoms to disappear in the course of encephalitis. In one case which I had occasion to observe, complete paralysis of the third nerve had persisted for a period of over two years.

Dr. Moren called attention to a prominent symptom that occurs in the Parkinsonian syndrome, and that is a tendency for the eyes to deviate upward. In 1926, Lehrfeld of Philadelphia reported five cases that came under his observation in which this phenomenon was noted. It was a conjugate movement of the eyeball upward until half of the pupil was covered by the upper lid. The patients were all able to move their eyes from side to side. A great many times it was noticed by the nurses and attendants that the attack of upward deviation could be terminated by covering the eyes or by attracting the patient's attention by an order to look down or by giving him something

to read. This fact that the patients could be brought out of the attack led Dr. Lehrfeld to discard the theory that it was due to paralysis of the nerve which occurred in the acute stage of the disease, and to attribute the phenomenon to an irritative process that involved the basal nuclei and associating fibers which have to do with the upward movement of the eyes.

Pupillary findings are frequent in cases of encephalitis, but there is no feature of pupillary action that is characteristic of the disease. Miosis, mydriasis, inequality, loss of reaction to light and loss of reaction to accommodation have all been reported.

Cadwallader reported a case of bilateral sympathetic ophthalmoplegia. This condition is not known to occur in any other disease.

Fundus findings are reported on rare occasions. They are thought to be present in those cases where hemorrhagic infarction into the brain substance has taken place, giving rise to increased cerebral pressure.

In pathological studies, no distinctive finding has been made. They consist of degeneration of the cells of the nuclei, cellular infiltration and small areas of hemorrhage. Within the past few years Elder and some of his associates have been working on the subject of the etiology of encephalitis, and they are inclined to believe that it is due to a filtrable virus, probably identical with that causing herpetic lesions.

**John J. Moren, (in closing):** The only additional statement that I should like to make is that I am very suspicious of these young people coming in wearing a very strong magnifying glass. Only recently I saw an adult about twenty beginning to complain of a lot of irregular nervous manifestations, and I found that she was wearing a much stronger glass than I do when I read. I noticed that there was a disturbance of the accommodation.

I went back into the history of this patient and found that she suffered from what was called a "sleeping flu" about eight or ten years ago. I look upon that case now with a great deal of apprehension. I feel that her future is certainly in jeopardy; she is likely to develop the Parkinsonian manifestations sooner or later.

**Fever and Tachycardia Produced by Cerebral Tumors.**—On the basis of an extensive review of the literature and a consideration of the clinical history of his patient, Lafora states that the tumor of the sensory region led to irritation of the cortical vasomotor centers and a rise in temperature ensued. Spinal puncture and the withdrawal of 8 cc. of fluid caused a temporary drop. Although the site of the true thermoregulatory centers is in the infundibulum of the third ventricle as has been demonstrated by experiments and clinical observations, his case gives proof of the existence of additional thermoregulatory centers in the cortex.



PROPER USE AND SELECTION OF  
DIURETICS\*

GARLAND DYER, M. D.

Buechel.

For clinical purpose a Diuretic is any substance which increases the flow of urine or the output of any of the constituents of the urine. The objects of producing diuresis are to remove from the body undesirable accumulations which may be divided into; First, Toxins resulting from infectious diseases or following surgical operations; Second; Toxic retention products which are the result of acute or chronic nephritis, or circulatory failure in cardio-renal disease or portal vein obstruction in hepatic disease; Third, Water. In the first class, water in copious amounts or if patient is unable to ingest sufficient amounts of water, normal saline by hypodermoclysis, intravenously or proctoclysis. Or ten per cent glucose solution intravenously or ten per cent glucose with ten per cent sodium bicarbonate solution by proctoclysis. Any of these or all of them will usually, by flushing the kidneys, suffice, if there is no cardio-renal disease. In the second class, retention of nitrogenous waste due to arterio-cardio-renal or hepatic disease, it is necessary to use, in addition to copious amounts of fluids, various renal cell stimulants, such as Theophyllin, Theobromine, Sodium Salicylate, Theobromine Calcium Salicylate; the citrates and acetates of Ammonium and Potassium and the Caffeine compounds such as Caffeine Sodium Benzoate and Citrate also Cream of Tartar may be used. At same time Diaphoresis, Venesection and free Catharsis with bland non-irritating diet will be of advantage. Care must be exercised to avoid further injury to an already diseased kidney. Digitalis should be used in cases where we have cardiac insufficiency due to chronic myocardial and endocardial lesions. In the third class where we have water retention in subcutaneous tissues or in the cavities; in other words oedema whether local in the tissues or ascites or pulmonary oedema. The treatment of these conditions in most cases demands diuretics together with other measures. For clinical purposes we will divide oedema into cardiac, hepatic, renal, nutritional and anemia. Most cases of oedema are due to a combination of two or more of these factors. For example, we often find Chronic Nephritis, Arterio-sclerosis, Chronic Endocarditis or Myocarditis with marked cardiac weakness in the same case. We also find in some cases that the kidneys will not eliminate the chlorides of Sodium and

Potassium, thereby causing accumulation of chlorides in the tissues which fact in itself causes oedema of the tissues. In cases of this sort the fluid intake should be closely checked with the fluid output; Digitalis and other heart stimulants should be employed; a salt free diet should be enforced. Metaphyllin in one and a half grain dosage, three times daily; Digitalis in sufficient dosage to maintain the circulation throughout the body; Salyrgan in dose of  $\frac{1}{2}$  to 1 cc of ten per cent solution intravenously or intramuscularly at 36 to 72 hour intervals; or Novasural in  $\frac{1}{2}$  to 1 cc doses subcutaneously at 48 hour intervals will prove of great value in increasing water excretion. In cases where we have Hepatic Cirrhosis with portal vein obstruction with Ascites; many clinicians have found that the addition of Ammonium Chloride, grains 75 to 150 daily, increases the diuretic effect of Salyrgan very markedly but is contraindicated if Dyspnoea be present. It has been found that Decholin which is the Sodium salt of dehydrochloric acid in dosage of 30 grains intravenously with Salyrgan, greatly increased the diuretic effect of the Salyrgan in cases of ascites due to Hepatic disease. Salyrgan in dose of  $\frac{1}{2}$  to 1 cc of ten per cent conditions due to its being a toxic irritant mercury compound. In the third class of cases the urine excreted, in the average case, has been increased from 300 cc daily to 3000 or more daily with progressive and rapid reduction of body weight. (Major). Care must be exercised in using Salyrgan, Novasural and other mercurial Diuretics for the reason that you may get symptoms of mercurial poisoning; viz Stomatitis, ptialism, diarrhea, etc. Ascites due to hepatic disease has often been cleared up by use of Salyrgan with Decholin and Ammonium Chloride. Oedema due to pernicious anemia and neutrorial disturbances must of course be treated by appropriate measures.

## DISCUSSION

John W. Scott, Lexington: A great deal of harm may be done by forcing water as a diuretic. I think it is very important to bear in mind that the kidney's inability to excrete water should not thus be taken by storm, so to speak. If the kidney is not able to put out more than, let us say, 500 c. c. or 1,000 c. c. of fluid, it is not wise to put 2,000 c. c. in twenty-four hours into such a patient, for the reason that the kidney's function in that respect has been demonstrated to be bad. It has been shown, particularly by Fay, perhaps by others, that many a patient in uremia has gone over the brink with edema of the brain who has been water-logged by persistent effort to increase the urinary output by forcing fluid upon a kidney which is incapable of excreting fluid. It seems to me to address itself to our common sense that the

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

patient, being oedematous, already has too much fluid; if the kidney is not capable of putting out, in the presence of all this fluid, more than a certain amount of urine, it does not seem logical to add water. It seems to me disaster in such a case could easily be forecast.

In my experience, salyrgan has been so extremely useful in combination, as has been said, with ammonium chloride, which raises the level of blood urea and works with it as an acidifying diuretic, that I confess we are not using the milder diuretics such as diuretin and theocin.

I think that moderate impairment of kidney function in the absence of acute nephritis is not a contraindication; if there is considerable impairment one should approach the use of salyrgan rather tentatively, and it is better to use as little as 25/100 of a c. c. at first rather than half a c. c., which is the ordinary initial dose; otherwise mercurial poisoning may result.

These diuretics are tremendously helpful in the failing heart which does not respond to rest and digitalis and sedative drugs. If .5 c. c. is not exceeded as the initial dose and 1 c. c. in subsequent doses and the intervals kept at three days or more, I think, that harm will rarely result.

**Frank M. Stites, Louisville:** The subject of diuretics is, of course, quite a large one, and one that is being investigated daily. Recent work has been extensive, and in the past few years we have seen many changes in our opinions regarding the use of diuretics. One of the most important things to understand before selecting our diuretic is to determine, if possible, what structures the diuretic needs to act on. As we know, diuretics act on various structures, the tissues of the body, tissue fluids, capillary walls, renal vessels, glomeruli, tubules, and other structures of the body, and if possible, it is a decided advantage to determine which structures need the diuretic action.

Very frequently, however, the selective action of our diuretics is not understood, and to determine such action is rather a difficult problem. Water we know is our prime physiological diuretic. Dr. Dyer mentioned digitalis, one of our oldest diuretics. Today there is some discussion as to whether digitalis is a true diuretic. We do know, however, that greater effect is secured from our digitalis usually in combination with other diuretics.

Dr. Dyer mentioned the various groups of diuretics that we have been in the habit of using for past years. We know how our salts act, but we have found another use for our salts in recent years, as he mentioned, in combination with the mercurial preparations, namely, novasurol and salyrgan. By preparing our patients first with the salts, such as ammonium chloride, and ammonium nitrate, we secure much better results in using our newer preparations.

One other diuretic that has been used recently rather extensively that I don't believe was mentioned, is the bismuth combinations, particularly potassium bismuth tartrate, prepared originally as an antisypilitic measure, and after continued use we found our patients frequently would respond with profuse diuresis, so much so that today in some of our cases potassium bismuth tartrate seems to be the diuretic of choice.

I think probably the group of diuretics used most extensively is the purine derivatives, namely, theocin and diuretin, caffeine coming in the same group, its action being somewhat more questionable.

We find frequently in our patients where diuresis is needed, that we may try a certain diuretic over a length of time with very questionable results, and then changing for no appreciable reason except that we have not secured the results desired, we secure excellent results with another diuretic. When we do not secure the proper diuretic effect from a certain drug, we should not become discouraged, but try some other preparations used in such conditions. It is frequently encouraging to see the results.

One other substance that is used in a measure that is not entirely understood is urea. Frequently in our cases of chronic nephritis where we have run our blood urea and there is probably some elevation in the urea of the blood, when those patients are given urea in fairly large doses we see copious diuresis, apparently due to an osmotic action, and I think it behooves us to bear this preparation in mind in our cases where other diuretics have failed. I have seen very encouraging results in the use of this preparation.

**Garland L. Dyer, (in closing):** I want to thank the gentlemen for their courtesy in discussing the paper.

Sometimes calcium chloride, (15 gr. dosage) when other diuretics fail, intravenously or per mouth has a splendid effect and is of great aid in increasing elimination of the fluid from the tissues.

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**Convenient Marker for Thyroid Incision.**—Tyler has found that bismuth violet is excellent for marking the line of incision for thyroid operations. With the trial necklace in place, the proposed incision is outlined with the dye. When it has dried, painting the field with dilute tincture of iodine or 5 per cent alcoholic solution of trinitrophenol will not obliterate the mark. It remains a black line easily distinguished. If alcohol alone is used to sterilize the skin, the mark may be obliterated, but not completely so. Though indistinct, enough of the dye may remain to identify the line of incision.



## THE RELATIONSHIP BETWEEN THE DOCTOR, THE SURGEON, AND THE PATIENT\*

EDWIN A. STEVENS, M. D.

Mayfield.

A renewed interest in this subject is indicated by two recent events; viz: The Louisville Medical Society spent almost an evening discussing it, and one of the largest medical societies in New York City invited a general practitioner from North Carolina to read a paper upon a similar subject at one of its meetings a short time ago. This is a question of ethics; and since ethics is the science of moral duty, it might be assumed that it would be governed by laws that change but little; however, it is seldom absolute, and changing human relations may change the rules that govern these conditions.

It is the purpose of this paper to present the views of the general practitioner, or, to be more exact, to show the unsatisfactory situation of the country doctor.

It is the opinion of the general practitioners with whom I have associated that they are not receiving their part of the loaves and fishes that accrue to the medical profession. They have always felt that they occupy the place in the medical profession that the historian, when enumerating the causes that led to the French Revolution, assigned to the Common people. He said at that time there were four classes in France, the Royal Family, the Nobility, the Clergy, and the Common people; the last were numerous but unimportant.

A few years ago there were many people who assumed that the days of the general practitioner were nearly over, as there was no place at this time in the medical profession for a class of doctors who knew so much about everything and so little about any one thing in particular; but the general practitioner remains with us, and it would seem to be necessary to have some group to correlate the findings and in many cases to administer the treatment unless it is to be done by the Sears Roebuck method.

The changing order of things, however, has gradually reduced the work done by the general practitioner, and probably the end has not come yet. The advances in preventive medicine have been the prime factor in cutting down his income. Typhoid fever, Dysentery, Malaria and, in many communities, Diphtheria have been cut down to a decimal point of what they once were. When the writer of this paper began his practice, the bulk of his work was Typhoid fever and enterocolitis; now sometimes a year inter-

venes between cases of Typhoid fever. The health nurse and full time health officer, where they are employed, are said to limit the general practice further. The clinics and increasing number of small town hospitals take another slice off his income.

There is an ever increasing demand for the hospitalization of serious cases; and, where possible, the general practitioner should retain these cases under his control after they are taken into the hospital, but this is not always practical. The only class that furnishes any income to the doctor is the class that is able to pay, and this group more and more demands equipment that is beyond the ability of the general practitioner to supply. The financial depression has added an acute *sursum corda* or *chronic condition*; and while the family physician's services are much needed, an income sufficient to maintain the doctor and his family is not always attainable. Quite a number of general practitioners whom I know are consequently considering giving up general practice and going into other fields of endeavor.

Nearly all general practitioners have three classes of patients: those who pay nothing, those who can pay moderate bills and those who are wealthy. The first and last need not be considered, as the state can take care of the first, and the last will take care of itself. The great bulk of the practice is made up of those who can pay their bills as long as they are not excessive; but prolonged illness, operations, funerals, and other misfortunes soon exhaust their ability to pay, and the man who gets there first is the only man who gets much.

A great deal has been written on this subject in the last twenty years, but nearly all of it in the interest of the competent surgeon, and comparatively little for the benefit of the general practitioner. Much has been written in condemnation of the disreputable and incompetent surgeons who have been divided by their critics into two classes, the "half-baked" and the "fee-splitters;" and for this occasion I am going to divide the competent surgeons into two groups, the "hard-boiled" surgeon and the humanitarian. No reflection is intended upon the ability of the one designated as "hard-boiled," nor upon his honesty, but simply upon his attitude toward finance. The "fee-splitter" is usually a city surgeon who has a political pull or in some way gets a hospital staff appointment which gives him an opportunity to pose before the public as a real surgeon. The "half-baked" has his surgery thrust upon him, as I have personally had an opportunity to know, or in some way conceives the idea that he is a bit talented in that way and does some surgery as a side line.

These groups are pretty well understood,

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

for about twenty years ago the lay press waged a vigorous campaign against them. The daily papers and popular magazines were so full of references to the "half-baked" surgeon that many people wondered whether it was a sudden spasm of the news writers or a well financed campaign in some one's interest. This question has never been settled.

There is seldom an address made by an official of one of our national societies that these men do not come in for unfavorable mention, but reference is almost never made to the selfishness that the general practitioner sometimes meets when he takes his patient away somewhere for surgical treatment. The family of the patient will usually accept the home doctor's choice of surgeon; if the doctor selects a "half-baked" surgeon and gets back a corpse, as he sometimes does, he is both legally and morally responsible for the dereliction. The real surgeon or the humanitarian as I have termed him, has a moral right to denounce such acts, for some times the doctor succeeds in switching these cases to an inferior surgeon against the will of the family, and I do not know of anything that gives the doctor a better argument than to say that the family's choice is hard-boiled and none of the doctors can get along with him. The family, however, will not always permit the attending physician to choose for them without protest, and in over-riding justifiable objections on their part he is most culpable.

If the patient finally gets into the hands of the "hard-boiled" surgeon, he sometimes comes out a financial corpse; and it matters not who made the choice of surgeon if difficulties arise, such as loss of the patient, unsatisfactory results of the operation, or excessive or unexpected expense; the doctor is nearby, and he nearly always hears more complaint than the surgeon. Many times has the paymaster in the family said to me, "Doctor, why did you not take care of me in this case? I am nearly ruined."

It is not the intention of this paper to charge all unfairness to the surgeon, be he "fee-splitter," "half-baked," or "hard-boiled," for some extremely irritating things are done by the selfish general practitioner in his relationship with the surgeon, such as switching the patient against his, the patient's will, holding the patient till he is hopeless, or failing to carry his part of the load when the operation results unfavorably; but sufficient publicity has long since been given the general practitioner, the "fee-splitter," and the half-baked" surgeon. Especially has so much been said about the general practitioner and his love for "fee-splitting" surgeons that he is almost afraid at the time

of operation to say anything about his fee lest he be considered unprofessional. The surgeon seldom fails to ask the general practitioner about his own fee and expects his aid in getting it; but when the situation is reversed, it immediately becomes unprofessional.

Let me recite this true story of a surgeon, a general practitioner, and a patient. The doctor, upon writing to a surgeon for his price for performing a certain operation on a man of moderate means, was informed that it would be seventy-five dollars. The doctor told the patient to procure one hundred dollars to pay his medical bill, and he would go with him; after the operation the doctor told the surgeon that the patient had a check for one hundred dollars which would be given the surgeon, and that he, the doctor, was to have twenty-five dollars of that amount. The surgeon, flying into a rage, asked the doctor if he took him for a "fee-splitter." The doctor, going to the patient and asking for the hundred dollars, went back to the surgeon, gave him seventy-five dollars, and said to him, "This is the last patient I shall ever bring you." Thus ended a professional friendship of many years' standing, and the surgeon wondered why.

In a large southern city a wealthy woman recently left a fund of three hundred thousand dollars to build, equip, and finance a memorial hospital. She selected five men to carry out her wishes. After months of careful investigation the head of the committee, one of the leading cotton factors in the city, filed their report and then asked to be discharged from further service on the board as his investigation had revealed the existence of such unsatisfactory relations between the surgeons and the general practitioners that he could not see how a hospital of that kind could be run without ruinous friction. The surgeon, he had discovered, would not even accept a check in payment of his fee if it embraced any portion of the fee of the doctor who brought the patient to the hospital. It was a condition unheard of in any other business or profession, for business men have always been careful not to kill the goose that lays the golden egg. When a doctor takes a patient to a surgeon who accepts the patient, the surgeon, in all fairness, becomes a partner in the case and is under an ethical obligation to do the best he can for the patient and to be fair with the doctor. The surgeon need not take the patient if he does not wish to; but when he accepts, he and the doctor become mutually bound as partners so far as that case is concerned.

To illustrate further the attitude of the "hard-boiled" surgeon, the following experience will serve. Recently an elderly patient of mine who had a family and whose



earning days were nearly over asked me to find out what a certain operation would cost him. In one city a surgeon wanted three hundred dollars; since that seemed too much, two other surgeons in different cities were asked about it, and in each case the charge was identical—three hundred dollars. When they were told the man was unable to pay that fee, the reply was, "That is my price and I can make no concessions." In another case of a different character a surgeon was asked for his price for a certain operation; he set five hundred dollars, and added, "If the man cannot afford to pay this price, he had better go elsewhere."

Several weeks ago a medical friend of mine called upon some professional friends in one of the large clinics in the south, and the business manager of the clinic told him the following experience which had occurred during a recent collecting trip. He had a debtor in a town of a few thousand inhabitants upon whom he had intended to call but before doing so he stopped to see the doctor who had originally sent this patron to the clinic, to solicit his aid in collecting the balance. The local doctor was polite to him, but told him that he could be of little service. The doctor then showed him his books, which revealed that the patient had been directed to the clinic five years previously; and although the local doctor had done the family practice during the intervening years, he had never collected a cent for the work. To pay the clinic, a mortgage had been placed on the patron's home the first year for its full value and remained unpaid. This, the business manager said, was not an isolated case, but that numerous incidents of a similar character had come up during the trip.

In 1916, by the courtesy of this association, I was chosen to deliver the oration on general medicine. My paper, upon "The Future of Medicine in Kentucky," prophesied that conditions in this state would lead to the establishment of numerous small hospitals in county sites in Kentucky which would be owned by doctors, and that group practice was certain to follow. At that time there was one private hospital west of the Tennessee river in this state, and now there are eight. A large portion of the major surgery in that section went elsewhere, and now surely 98% of the surgery originating in that section is finally and successfully treated there.

The "hard-boiled" attitude which has hastened this development may not be unethical, and the surgeon may be entirely within his rights to assume it; but surely it does not seem humane. Money alone has never been the *sine qua non* of the surgeon, and nearly fifty years of experience and observation in

the study and practice of medicine has led the writer of this paper to believe that such an attitude is good for neither the surgeon, the doctor, nor the patient; that the surgery of the country is gradually drifting away from surgeons of this type; and that the humanitarian, the man who considers the other person, is getting the benefit of the drift. As fairly convincing evidence of this, the most successful and popular medical units of this country maintain an efficient credit department and consider a patron's financial ability in all cases of any magnitude before fixing a fee for their services, for surgery is in some respects like business in general—it goes to the place that has the largest number of advantages; and, other things being equal, a pleasing personality and a reputation for fair dealing with both doctor and patient will in a large proportion of cases dominate the selection of hospital and surgeon.

This paper is not intended as an ill natured criticism of the consulting portion of the medical profession, but a plea for a sympathetic attitude of those in power toward the general practitioner class, which is made up largely of country doctors.

#### DISCUSSION

John W. Scott, Lexington: I am in rather a neutral position in this matter. Limiting my work to internal medicine here in a city even as small as Lexington, the question of the doctor in the country district referring the patient to the surgeon doesn't exactly "come into my life." While the individual surgeon in most instances has a splendid and humanitarian attitude in the matter. I have the impression that the organized bodies of surgeons do not have a sympathetic attitude toward the general practitioner, particularly the general practitioner in the country.

It is well for one to try to visualize in his own mind, if that is not a mixed metaphor, the situation that presents itself to the practitioner in a remote town who has to bring a patient to the surgeon. Suppose, for instance, a common occurrence, that of a man attacked by acute abdominal pain where the practitioner has to determine whether he has to deal with appendicitis which needs immediate operation or whether it is perhaps a neurosis or some other thing that is not at all compelling or does not require surgery. Those of us in the city who have to make such decisions send the patient to the hospital and observe him having all of the facilities at hand. The surgeon is within an hour's call, and we don't have much tension of decision. On the other hand the man who has to bring the patient fifty or sixty miles to the hospital—often a patient of limited means—is confronted with a tremendous responsibility. I he brings him unnecessarily and the surgeon decides that, after all, operation is not required,

the practitioner is charged with a mistake; the patient didn't need surgery and would have done just as well at home. In such cases after perhaps one or two visits taking his reputation in his hands, he has sent the patient to the hospital. It is hard for the patient and his family to realize that the physician has earned more than the price of one or two calls. Yet we all know that when we reach decisions with that amount of responsibility involved, we earn a great deal more than that amount of money.

The general practitioner, particularly in the country districts, who sends his patient to the surgeon in the distant city, should have a considerable share of the emoluments arising from that case. It is all very well to say that the practitioner can charge for what he does and the surgeon will charge for what he does, but the patient cannot see it that way and does not realize the relatively high value of the practitioner's service. I am perfectly aware of the fact that no plan is feasible which will not stand the light of day, in other words that no plan is proper or feasible which involves deception of the patient, which means that no share of the surgeon's fee can be paid to the practitioner. At the same time, I believe, if the mental acumen and enthusiasm which the surgeons use in the development of their art and science were diverted in some degree to this problem and if it were viewed more sympathetically, some plan could be devised by which the physician under these conditions could get his fair share of the fee.

**Irvin Abell, Louisville:** I feel that Dr. Stevens in drawing a picture of the hard-boiled surgeon draws a picture of a type of man one finds in every profession. I should like very much to reclassify, if he will permit me. Let us allow the hard-boiled surgeon to stand with the picture that he has given us. Let us contemplate the humane surgeon, for he is the one I should picture as the ideal, and beyond that let us eliminate the incompetents and the fee dividers from the discussion as unworthy.

Altruism in medicine has come down to us through the centuries. May I go back for a moment and call your attention to the time of the schools of Avignon and Bologna and various others contemporary with them, when practically all the teachers in those schools had taken certain degrees of holy orders.

As a result of religious inculcation into the principles of the early periods of the medical profession has come down to us to this day, the altruism. There is no group of men in the world with which I am familiar who so frequently give of their time and talent and ability to mankind as doctors. The hard-boiled surgeon certainly has not any of that feeling which to me is one of the most beautiful heritages which has come to be identified with the medical profession. Surely the medical practitioner should

receive his just due. The surgeon who unwittingly takes all that the patient has to pay may be a good surgeon, but he is not a humanitarian one. Humanitarianism in the practice of medicine is just as essential as science.

May I illustrate that to you by something Dr. McCormack told me of a personal observation of Noguchi, with whose wonderful work in medicine you are all familiar. Noguchi was a real scientist; he was a Japanese and not a Christian, hence did not have the regard for human life that we have. When he developed his serum for yellow fever, none of the laboratory animals being susceptible to this disease it was necessary for him to find human animals upon which to conduct his experiments. Going down to Ecuador, in Guayaquil, he obtained permission of the government to carry out his tests upon a company of soldiers. He was supplied with 150 men. He said, "I give to fifty of these a complete and protective dose of serum. If my idea is correct, none of them will have yellow fever. I give to the second fifty an incomplete dose of serum. If my idea is correct, some of those will have yellow fever, some won't; some will die of it. I give to the third group sterile water. If my idea is correct, all of those will die." The experiment turned out as he had indicated. That is the scientist. I wouldn't want such a one for my physician. I wouldn't want a man to sit at my bedside and be willing to consider only the scientific aspect of medicine in so far as how it affected me and care nothing for the humanitarian side.

Judging from Dr. Stevens' description of the hard-boiled surgeon, he is the scientist in so far as monetary consideration is concerned, and to be perfectly frank with you, I wouldn't want that surgeon to have the welfare of my body in his care when his greatest interest was the \$300 he was to get for his surgery.

Personally I feel that the doctor is entitled to his remuneration, and I feel as does Dr. Scott that the physician who promptly recognizes a perforated appendix, a perforated stomach or duodenal ulcer, or a ruptured tubal pregnancy, has rendered to that individual patient a service greater, possibly, than the surgeon renders when he closes the perforation or takes out the ruptured tube since early recognition is a *sine qua non* for successful treatment. Unfortunately the practice of medicine in most localities has been based on time and visits, which goodness knows is an unfair method of establishing remuneration for service. A service that permits saving of a human life may not take but thirty minutes, as in the instances mentioned and financial remuneration should be based upon the service rendered rather than upon the time consumed in seeing the patient.

As I look at it, the best way to correct the evil under discussion is by a joint consideration on the part of the surgeon and the doctor of the



service which each renders. There is every reason why the family doctor should charge for the services he renders, and there is every reason why the surgeon should back him up. The surgeon must, in large measure, depend upon the family practitioner's judgment as to the ability of the patient to pay. The doctor is in contact with the patient and knows his financial circumstances; the surgeon is not, and he must rely upon the general practitioner for knowledge of this. If he has any humanitarianism in him, he will not only apply fair treatment to the patient in his charges, but at the same time will place those charges in such a way as to leave an abundance to take care of the family practitioner, and certainly stand back of him in his charges so far as the value of his services to that patient is concerned.

When that time comes we will have humanitarianism on both sides and your hard-boiled surgeon will disappear.

**Arthur T. McCormack, Louisville:** I wish very much I might have written this paper myself, and might have said, myself, the things that have been said in the discussion, because they are all so excellent. Dr. Stevens is always thoughtful and thought provoking when he presents a paper to this Association.

When I began to practice medicine I had the advantage of having my father for my mentor. He had done a very large consultation practice during most of the years of his practice, and he always said to me: "When you are called in consultation, remember that the most important thing you are going to do is to leave with that family a greater confidence in the physician who called you than they had before you went. If you fail to do that you have done them more harm than if you fail to make a diagnosis of the case, because the loss of confidence in their family physician is the greatest loss that can occur to a family except the loss of one of its members."

He said to me very frequently: "If a physician sends a case to you in consultation and you find subsequently that that patient comes back to you instead of to the family physician for future services, you must remember that you have failed in your obvious duty to your patient." I think it is important for us to remember that.

There is another thing that seems vital in this day, when consultation is becoming so much more common, should be even more common, than it ever was before because the specialists have developed for the comparatively small percentage approximately 10 %, of patients who need their services such remarkable technic and facilities that they are essential in certain classes of cases, and that is, the consultant, after he has examined and cared for a patient, should fully inform the physician referring that patient as to the condition when the patient returns to him, verbally if possible, in conference and con-

sultation; but if not, when he returns from the hospital a full statement of the treatment and condition in which the patient leaves the hospital should be sent to the family physician so that he knows exactly what has been done and has the best possible knowledge of conditions to guide him in the after treatment of the case. This is too frequently overlooked, and I believe that it is one of the essentials in the development of the harmonious medical organization in the future that we hope, and, in Kentucky propose to, develop, because what we do we are going to do right in this state. We have before us always, not only in this matter, but in everything confronting Kentucky, our state motto: "United we stand, divided we fall." If we are united fairly and squarely we will stand; if we are divided, as we have been too frequently in the past to our hurt, we will fall. We have been living under the last half of that motto quite too frequently, and I believe in the future after such thoughtful discussions as this, in which I hope many of the other members will take part, that we will be united because we are determined to deal with each other and ourselves squarely, that we may be the representatives of the greatest calling that serves the public, the physician.

**J. L. Toll, Lawrenceburg:** I have been attending the meetings of this society about one-third of a century and I have made it a point never to allow an opportunity to pass of saying something when the status of the general practitioner was under discussion.

Having spent my whole life in a small community without a local hospital; having given all my time to the work as a general practitioner I feel I am fairly confident to speak on the subject before us at this time.

It is generally conceded by all of the profession, I believe, that the general practitioner is not adequately compensated for his labor. I am referring to physicians in the small communities, however, I cannot place the blame on the surgeon. My relations with the surgeon have been agreeable, and if the surgeon was foolish enough to divide fees with me I could not, with approval of my conscience, accept a fee from the surgeon, for under the present status of the public mind, they do not approve of such an act, and because the surgeons of good repute of this State condemn such a procedure.

If the public were educated to such an act and knew when a physician recommended surgery and after the case was over that one bill would be presented which covered all the professional services rendered, the bill to be presented by either the surgeon or physician, and the patient knew that there was a working agreement between the best of physicians and surgeons then I cannot see the wrong in such an act.

Something must be done to improve the con-

ditions of the physicians in the rural communities in order that the community may have a local man to look after the needs of the families away from the centers.

If agitation of this sort comes from the rural physician it would not have the force and effect that it would if it came from the surgeons themselves so it appears that educating the public, and keeping this subject before them is finally to be left to the various surgeons.

I feel that the local physician should demand reasonable compensation and should educate his patients to the fact that his services are not so many dollars a call, but should be determined by the character of the services rendered.

I suggest to the leaders of this society, your duty to the State and to the profession demands that you give serious thought to the subject under discussion.

**H. L. McLean, Wilmore:** I am one of those country doctors who lives down where the buckberry bushes grow red and we bask in the shimmering sunshine at the foot hills of heaven—a glorious place to contemplate the city surgeon.

I want to congratulate Dr. Stevens on his able paper, on behalf of the country doctor, and to second the remarks of Dr. Scott about the attitude of the country doctor and the city surgeon. There may be some hard-boiled surgeons, no doubt we have them—but we must “bear the ills we have” and be charitable, for they have missed their calling—they should have been lawyers. It may be that many of us have missed our calling and stand not so well, even as do our so-called hard-boiled city brothers.

I have been referring patients to surgeons for a third of a century. Sometimes they get the money, sometimes I get mine, and sometimes neither one of us gets it. I think if the surgeons to whom I have referred these patients would square up their books and count their expenses their balance would show in the red today, as I know mine would.

Knowing the surgeons of Louisville and Lexington as I do, I never hesitate a moment when it becomes necessary to refer a patient. Dr. South struck the keynote fair and square when she said that the country doctors know the patient, and his financial condition, better than any one else. They do.

Many times a patient will say, “Doctor, how much will this cost me? I have no money in the bank.” If I know the man is good I make arrangement at the bank for him, let him borrow the money, go to the surgeon and say, “This man can pay you one hundred and fifty dollars,” (or what ever amount fits the case). He will have a nurse and a room and all together it will possibly amount to \$500.00. I say to the patient “Dr. Smith will charge you so much and I will charge you so much.” When he is through I give the surgeon a check. There is no fee splitting; in many cases it can be handled no

other way. If I let him go to the surgeon and he makes his charge and I say nothing about it he gets it all and I get nothing. Many times I get mine and let the surgeon collect his—and there is nothing wrong in that.

Occasionally the subject of the country doctor comes up. I think Dr. McCormack believes we haven't enough doctors in the country. I am for him when he is right—I was for his father right or wrong—I never found him wrong. In the horse and buggy era, when I started practice and when some of you were already busy, we had to go horse back or wade the mud, and you didn't get far. There were more doctors in the country then than now. It was necessary and right there should be. It took you all day to make a ten mile drive and get back. You took your biscuit in your pocket to munch as you rode along. Now you make that twenty mile drive in an hour's time and get home in time for your lamb chops and hot fritters. We don't need as many doctors in the country now as formerly, and we try to be as efficient as you city fellows, often we fail, and we wonder if the city doctor ever makes a mistake.

Some one brought up the question of the responsibility of the country doctor. The country doctor must make his diagnosis, devoid, many times, of the laboratory paraphernalia which is so essential, and his reputation is staked on whether or not he is correct when you open the abdomen. I sometimes hide behind what the Mayos said, and tell the patient; “You go to the Mayos and they won't tell you what is the matter until after they operate, and they are the greatest surgeons in the world.”

The country doctor must make his own diagnosis. In ninety-nine cases out of a hundred it must be right or he may be discredited at home. He studies hard to make that diagnosis. He takes the case to the surgeon, and the surgeon doesn't always give an opinion. Often he says to the patient, “Well, you have an acute abdomen.” What does that mean to a patient? He might as well have told him he had alopecia areata for all he knows about it. Yet you go ahead and operate, and if the surgeon finds that your diagnosis at home was correct, you are all right. He gets his fee—and we wait for ours.

At the same time, when all is said and done I think the city surgeon is the standby of the country doctor. What would we do without those capable and efficient surgeons and those painstaking internists in the city? The roads are good, our automobiles are fairly comfortable, and a patient with an acute abdomen is better sitting up in your little Ford car than in an ambulance—and you can get along better; you can drive with one hand and hold him in the car with the other. You get him to the hospital and turn him over to the surgeon and say, “Here, Dr. Smith is this patient. He is throwing up and he has an “acute



abdomen." Help him out." The surgeon stands by you, relieves the patient, and the country doctor goes home feeling that satisfaction that goes with duty well performed and knowing his patient is in the professional care of a capable surgeon.

We know that in these days of good roads and quick transportation, the patient is in no danger. But in the long ago when we couldn't get him to the hospital, when we had to ice-bag him, to poultice him, and to get him out the best way we could, that is what makes our hair get white early. Now we have the surgeon to help us, we put the responsibility on him, the surgeon may get the money but the patient is saved and we get the relief.

**C. M. Eckler, Williamstown:** I am a country physician myself. Down where I live, about fifty miles north of here, we don't have any friction between the surgeon and the practitioner. We are friends. When I see a case is surgical, I turn it over to my surgeon. Most of our surgery there is done at Covington and Cincinnati on account of distance. They take care of it, and when they are through they turn the case back to me. There is no splitting of fees. I have practiced medicine for twenty-two years and I never have had a man ask me or suggest to me that a fee be split, nor have I done so.

The country practitioner is the essence and bulwark of the profession. Let him be qualified to render good and efficient service, and you don't ever have to worry about him. From these ranks come your good surgeons and your good specialists. Our surgeons and specialists are capable, honest men of stirring character and integrity and we are all friends, and there is no use of having any hard-boiled man anywhere in the profession.

**W. L. Tyler, Owensboro:** I have gotten a great deal of information from this discussion. I don't know of a thing that has been said here that I don't approve of, but there are some things that we can see from our side of the fence that maybe the other fellow doesn't see.

I appointed myself on a committee down in the community where I practiced medicine a good many years ago, to furnish the public with some information that I thought they were entitled to. I tried to school the public and the people for whom I practiced medicine in the real value of the service that the general practitioner gives.

One of my closest neighbors said to me not long ago: "You charged me for your service more than the surgeon who performed the operation." I convinced that fellow fully and satisfactorily that my services were worth it.

In a public meeting not long ago when I was asked to say something, I wondered what I could say to impress the lay people with some facts that I thought they were entitled to. I said to the president of the organization and to the people who represent the activities of the

health work of the State of Kentucky: "I want to commend you in the particular work which you are doing. Personally I ought to feel malicious to you, from the simple fact that when I began the practice of medicine, the first year I practiced I had nineteen cases of typhoid fever, and last year I had one. Somebody skinned me out of eighteen cases of typhoid fever, and if they had been worth only \$50 apiece, it would have been an income of \$900. The same year that I had nineteen cases of typhoid fever, there must have been 500 cases of typhoid fever in my county. Ten percent of all the cases of typhoid fever died. Ten per cent of 500 would make 50 cases, and the undertaker ought to have a grievance against you, because you skinned some undertaker out of a fee."

I have tried to get before the laity the serious consideration of the fact that the man who administers diphtheritic antitoxin and saves the life of the child has rendered just as great a service as has any surgeon.

I made the statement to a friend of mine not long ago that there is not a general practitioner in the town where I live but has saved more lives than any surgeon in the town. I think that was fair. The public likes spectacular things. A man with a gown on and a knife in his hand, who cuts up somebody, does a great operation, and the patient wants to talk to you all the rest of his life about that operation. It is up to the general practitioner who comes in contact with the public to school them and furnish them with the information.

I approve of everything that has been said here. Dr. Stevens' paper was a wonderful paper, but it rather occurred to me that for every fee-splitting surgeon, we have a whole lot of fee-splitting general practitioners.

**Edwin A. Stevens, (in closing):** I have made no effort to defend secret fee-splitting. I dismiss that with that statement, that is all there is to it.

You may feel I am a little egotistical in making the talk I have made, but I believe I am thoroughly entitled to draw the conclusions indicated in my paper. With the exception of the army service, I believe I have had as varied a service as any man in Kentucky. I started on a horse; then I got a buggy; then I got a car. I am now part owner of a 40-bed hospital, and I believe I have made as many consultations in the home as any man in Kentucky. That is some of my experience, and I adhere to the statements I have made.

I want to thank especially these men who have commented on the paper. I have got the reaction that I wanted. I wanted to call the attention of the profession to these things. I find that some of them have had a different experience from mine, which is all right; they seem to have enjoyed it, and I have nothing to say against it. But my own experience has been that there are some rather "hard-boiled" sur-

geons, and I am not going to take it back.

I am going to tell you a little story and quit. I was reared in the country, and while I was growing up, one day I was at the dinner table in a home where there was a number of visitors. The crowd was rather large, and the chicken was rather small. There was a little girl there, and another visitor besides myself. The other visitor got hold of the dish of chicken first, and he was very slow about helping himself, and he took a very large piece. The little girl, five years old, stood it as long as she could and then said, "Mister, please don't take it all."

#### RECENT ADVANCES IN PREANESTHETIC MEDICATION\*

HARPER E. RICHEY, M. D.

Louisville.

Modern patients seem to have little fear of the operation before time but are overwrought as to the anesthetic. Many, particularly those who are neurotic and easily upset, prefer a general anesthetic, fearing the noises of the operating room and its surroundings. Much of this can be eliminated by the proper psychic approach of the anesthetists some time before the proposed operation. Talk to them of their general condition, take a complete history, and make a thorough physical examination, and make them feel that you are omitting nothing in preparation for this operative ordeal. Sit and talk with them for a few minutes after your examination is finished and talk of trivial matters. Be their friend and make them feel that you have their interest at heart. Explain what they are to expect. If a preliminary hypnotic is to be given, explain its effect (if the patient is the type to whom you can explain such), whether they are to be drowsy before going to the operating room, or mildly satisfied, or asleep. If a general anesthetic is to be given, assure them that you will be with them constantly, watching their condition carefully, and that they will awake before returning to their room or after returning.

If the anesthetic is local or spinal, explain your procedure and calm their worries. It is a good trait to be a good conversationalist as well as an anesthetist in some cases. Some require constant vocal encouragement and others desire to be left alone entirely. Some need a constant, lively, cheery conversation and others must have absolute quiet not only from the anesthetists but from the surgeon and operative team of nurses and assistants.

Much outside of drugs can aid the mental attitude of your patient—cracked ice at hand, cold water to drink (provided there is no con-

traindication), cold towel on the face, comfortable position on the table; with spinal small pillow under the back and softly cushioned shoulder braces.

Every method possible should be sought to make our patients come to the operating room satisfied, quiet, and with the utmost confidence in our ability to avoid pain by whatever method and bring them through to a speedy recovery and health with as little inconvenience as possible.

To date, no one method of anesthesia has been ideal and we are still seeking. General, rectal, spinal, intravenous, local—all have their advocates. My duty is to present some recent advances in pre-anesthetic medication.

Many new hypnotics of the barbituric acid family have been pushed before the medical profession with little or no chemical or pharmacological research background. They are each and everyone exploited as the best and all in various dosages and with various results. Before adopting any we should know their composition—something of results achieved in various clinics elsewhere and cost as compared with results.

Preanesthetic medication is indicated not only for the relief of anxiety and fear of the patient but it is of definite value in the induction and conduct of anesthesia. Properly used, we have an easy induction and smooth course during the entire operation. Less anesthetic is required and more oxygen may be used thus avoiding a dangerous concentration of the anesthetic agent as when no supplementary depression is used.

Morphine and scopolamine, a combination frequently used, are still used frequently because of the ease in giving and because of years of use with nothing better in view. Morphine has many objections, namely: Tendency to constipation which hampers post operative course, depresses respiration and interferes with rapidity of induction of anesthesia, disturbs carbohydrate metabolism, in that it deters the blood sugar and acid base balances of the blood.

Hyoscine is said to synergize with morphine increasing its depressent effect on the cortex especially, but such is not always the case as many patients become confused and at times maniacal.

A study of such drugs has been made by Leake from their effects upon the Basal Metabolic rate, tactile discrimination, respiration, pulse rate, and blood pressure. As a result of his observations on barbital and its common derivatives, he concluded, "That barbital by mouth may be used as a possible substitute for morphine as a pre-anesthetic hypnotic if no pain is present." Barbital produces relief from fear and anxiety, tends to produce sleep, relaxation and amnesia in doses of one to one and one-half grams or

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.



higher. Basal Metabolic rate is depressed as with morphine but there is no residual stimulation and no psychic disadvantage from hypodermic administration. A rash may be produced, however, and with presence of pain it is of no advantage.

Leake finds that any of the derivatives of phenobarbital, as amytol, dial, ipral, neonal, phanodorn, have no advantage over barbitol as hypnotic agents. May 1 again reiterate a statement previously made. "Very few new drugs reach clinical trial in an ideal scientific manner."

Leake found barbitol the more satisfactory depressants in so far as lowering of basal metabolic rate, dulling of tactile discrimination, and tendency toward sleep are concerned. Amytol and phenobarital increased the basal metabolic rate especially in high doses.

The Germans have exploited many commercial derivatives of urea such as: Adalin, allonal, amytol, bromural, cibalgine, dial, ipral, luminal, medinal, phanodorn, pyraminol, veranol, etc., which have no great advantage over barbitol. Such combinations as allonal, cibalgine, or pyraminol which contain barbitol or its derivatives with amidopyrine are to be condemned. Such a combination is a violation of rational therapy and since the analgesic component is eliminated more rapidly than the hypnotic there is danger of the cumulative effect of the latter, particularly if repeated doses are given for continued analgesic action.

#### RECTAL PARALDEHYDE IN TONSILLECTOMY IN CHILDREN

Rectal administration of paraldehyde, a drug which induces a condition very similar to deep sleep, given as enema in bed, necessitates very little anesthetic but delays return to consciousness considerably although anesthesia is light.

##### Routine.

(1) Patient admitted the night before the operation.

(2) Soap suds enema in the morning.

(3) Bowels washed out one hour later.

(4) Paraldehyde one hour before sending to the operating room.

##### Dosage.

One dram paraldehyde per fourteen pounds body weight. Paraldehyde is dissolved in a solution of lukewarm saline; one and one-half ounces of saline per one teaspoonful of paraldehyde.

##### Method.

Solution should not be warmed. It is run in slowly. A well lubricated catheter is passed into the rectum. The air is expelled from the funnel and the tubing is clipped. The catheter is connected to the tubing, the clip is released, and the solution is run in

slowly, ten minutes being consumed for the whole procedure. When all the solution is in the rectum, the catheter is removed, a pad is placed on the child's perineum and the nates strapped together. The child is placed on back with legs together and is usually asleep within one-half hour.

##### Anesthetic.

Open ether is the safest and best anesthetic, requiring a very small amount and is taken with very little struggle. It tends to raise the blood pressure thus counter-acting the fall that paraldehyde produces. Ethyl chloride is safe but a large amount may be administered if the patient struggles and is therefore dangerous.

#### SODIUM ISO-AMYL ETHYL BARBITURATE (SODIUM AMYTOL)

A basic anesthetic producing comfort to the patient during induction and recovery. It is used in conjunction with inhalation, local, and spinal anesthesia.

##### Advantages.

(1) Induction easy and painless, unconsciousness comes on as a natural sleep, respiration quiet, post operative sleep is twelve to seventy-two hours, total loss of memory for events and pain.

(2) Small amount of supplementary anesthetics give complete anesthesia and satisfactory relaxation.

(3) Convalescence more comfortable.

(4) Helpful in poor risk cases as it gives light anesthesia and requires small quantity of inhalation.

(5) The drug is antispasmodic and hypnotic.

(6) Detoxifies anesthetics especially local.

##### Disadvantages.

(1) Time of induction.

(2) Necessity of supplementary anesthesia.

(3) Drop in blood pressure and more work for anesthetists.

(4) Requires careful post operative nursing care.

(5) Contraindicated in pulmonary suppurative, chronic productive cough because of danger of pulmonary edema. Old, obese, debilitated men are especially apt to develop such.

(6) Delirium, edema of the lungs, and nausea.

##### Method.

The drug is in crystalline form, a soluble alkaline salt with a Ph of 9.5 to 9.8, fifteen grains to an ampule. The contents of the ampules are dissolved in ten c. c. of sterile distilled water and if the solution is clear, it is ready for injection. Before the injection of the solution it is well to advise the patient that you are taking a sample of blood

for analysis to allay any fear they might have.

The injection is made under sterile precaution, as with any intravenous injection. It is best done in the patient's room. The blood pressure instrument is attached to the other arm and the blood pressure taken about every two to five minutes with very close supervision of the patient.

#### Dosage.

The dosage is determined by first, the general condition of the patient; second, the rate of onset of unconsciousness; third, fall in systolic blood pressure; fourth, the age of the patient; fifth, the metabolic rate; children and adults with hyperthyroid condition require more drug as do nervous, apprehensive patients, more apathetic patients, less; elderly, chronic, debilitated, shock cases require a smaller dose. The dosage consequently varies but the average normal dose is fifteen grains for a complete sound sleep. Some give one and one-half to three grains more than the amount necessary to produce sleep. The solution is injected at the rate of one c. c. per minute as timed by a watch to avoid too rapid a drop in blood pressure or a period of apnea. Should the blood pressure drop, injection is discontinued and the blood pressure rises or may give one-half c. c. 1:1000 adrenalin intramuscularly and usually the blood pressure will rise, or as has been suggested by one writer, to prevent such a fall, give 1000 c. c. of 5% glucose with one-half c. c. of 1:1000 adrenalin one-half hour before sodium amytal is injected with one-half c. c. Ephedrine six minutes after sodium amytal unless blood pressure was 150 or over in young people. However, the blood pressure was not always unaltered by this method but never dropped more than ten to twenty M. M. General Effect.

The patient falls asleep during the administration of the drug. They talk and are coherent for awhile but the words become slower and more drawn out and suddenly they fall asleep between words. Drowsiness ensues three to five minutes after the injection, then profound sleep, often snoring respiration. There is no nausea, vomiting, laryngospasm or excitement before sleep comes on. However, apnea or Cheyne-Stokes respiration may occur in large doses. Pupils are normal in size or slightly contracted. A gag reflex remains. A slight relaxation of rectal and vesicle sphincters occurs, corneal reflex abolished, skin reflex is practically never absent. The blood pressure always falls the amount depending upon the condition of the cardio vascular system and is more in debilitated, aged and hypertensive cases. It usually falls from five to thirty M. M. systolic and five to twenty diastolic. The higher the pressure the greater the fall.

Such a fall has no great untoward effect and does not contraindicate use of spinal as long as the patient is in trendelenberg position. Pulse.

The rate is slightly increased, full bounding, regular and never dirotic. Respiration.

The respiration is depressed, shallow and slow. In some few patients there is pallor, some cyanosis, but only when care has not been taken to turn the head to the side or to pull up the jaw or insert an airway. The respiration is slow until consciousness returns. Some mucous may be present in the throat which requires removal.

#### Genito Urinary.

There is no disturbed renal function. Catheterization is no more frequent than after other operative procedures.

#### Gastro Intestinal.

The patient is free from nausea and vomiting. The drug seems to depress the vomiting center or decreases gastro intestinal secretions.

#### Nervous System.

There is partial muscular relaxation at the time of unconsciousness. The reflexes are not abolished. The knee jerks and the pupils vary in activity. Restlessness of recovery is a reflex activity with some disorientation. Metabolic Effects.

There is a negligible change in the blood sugar, CO<sub>2</sub> combining power and N. P. N. Urine is normal except for a trace of acetone and a slight decrease in twenty-four hour volume output the first day post operative. Recovery.

The recovery is slow. The first twenty-four hours' sleep is in raps, lethargic for the next twenty-four. Memory of the first three post operative days is vague. The period of unconsciousness is variable depending upon the patient's condition and the size of the dose, a large dose causes prolonged sleep. Elderly patients are slower to recover, while active, thyrotoxic patients recover rapidly. Sixty per cent of the patients awake enough to talk and sip water in four and one-half hours. Thirty-three per cent awake in ten hours. Seven per cent are unconscious over 10 hours. None sleep longer than 15 hours. Restlessness is often evinced by aimless movement of the arms and legs, moaning, talking, and singing. Some require restraint, and all respond to small doses of morphine. Restlessness often seems related to a full bladder but morphine will also relieve such until a later spontaneous evacuation of the bladder. A minimum of morphine is required for pain during this period and there is a definite reduction in gas pains.

#### Indications.

(1) Spinal when indicated as best anesthetic at hand for the case when patients



refuse such.

(2) Local anaesthetics in amounts sufficient to produce drowsiness by vein. Best used by mouth in local.

(3) General inhalation in apprehensive, nervous, excitable patients and children.

#### Preliminary Medication.

It is best to use no other drug, Morphine has been used but it seems to depress respiration to such an extent that cyanosis, apnea or cessation of breathing may occur requiring artificial respiration or carbon dioxide and oxygen inhalation.

Supplementary Anesthetics. Ether, Nitrous Oxide and Oxygen.

A few cases of minor nature require none other.

#### Complications.

(1) Pulmonary edema.

(2) Broncho pneumonia.

Other Methods of Administration. Oral, Rectal, Intramuscularly.

(1) Oral, As used orally it is a valuable adjunct with  $N_2O_2$  and  $O_2$  in cases requiring little or no muscular relaxation.

#### Dose.

Adults six to nine grains one and one-half to two hours before operation. The average patient is asleep in one-half to one hour and it is important that they be not disturbed during this time. There should be no visitors, the ears should be plugged with cotton and silence maintained in the patients room and in the operating room. The patient may awaken, but as a rule is too sleepy to notice the procedure going on around him. He therefore will not worry much. The induction of the anesthesia will be easy. Frequently, however, in elderly patients there is a marked disturbance of the heat regulating center and patients complain of extreme cold and the body temperature drops to ninety-six to ninety-five degrees Centigrade. No blood pressure readings are required. It is less time consuming. Post operating nausea and vomiting is diminished and post operative sleep is three to four hours.

Disadvantages in Rectal, Oral, and Intramuscularly Rates.

Disadvantage lies in variable rate of absorption. Cumulative effect of large doses occurs, so if loss of consciousness is desired, the intravenous route is the safest and most satisfactory, as results are more uniform and consciousness is regained more quickly.

#### Use in Local or Regional Anesthesia.

In fifty per cent of the cases sodium amytol and local gave satisfactory results. The patients were asleep and relieved of excitement, free of apprehension and mental trauma. Patients in shock were operated with from four and one-half to seven and one-half grains intravenously and local. From the experience of McCallum and Zerfas it is best

to employ various general anesthesia and spinal in preference to large doses of sodium amytol intravenously and local. Four and one-half to seven and one-half grains of sodium plus one-sixth to one-fourth of morphine one-half to one hour before the operation give satisfactory sedative effects.

#### Rectal Administration in Children.

Dose—Less than one year, one-half grain.

One to two years, one grain.

Two to three years, three grains.

The contents of the capsule are dissolved in clear solution in distilled water and given as enema one-half hour before the operation. If the child is old enough to swallow, give by mouth if dose is less than ten grains. If larger, give intravenously.

#### AVERTIN (TRIBROMETHYL ALCOHOL)

A white crystalline solid soluble in water to the extent of three and one-half per cent at body temperature. If heated above forty degrees Centigrade or exposed to light, it decomposes to dibromacetaldehyde and hydrobromic acid which are very irritating to the bowels. It is readily absorbed and eliminated by liver and kidneys and appears in the urine with glyconic acid. The excretion is slow and fifty to seventy per cent is excreted in urine and recovered as bromine during the first twenty-four hours. The drug should be used as a basal anesthetic only; complete anesthesia never being attempted alone. It is of definite value in children, avoiding physical shock, and inducing sleep in the room.

#### Indications.

(1) Highly nervous, hysterical patients.

(2) Thyroid operations.

(3) Fractures of the aged, lessening the chances of pneumonia.

(4) Operations on the mouth or face with cautery.

(5) Children.

(6) Respiratory conditions.

#### Contraindications.

(1) Impaired kidney functions as evinced by (a) urinalysis (b) P. S. P. (c) Blood chemistry.

(2) Cachexia.

(3) Septicemia with marked anemia.

(4) Marked hypertension.

(5) Inflammatory or ulcerated rectum.

(6) Hepatic Lesions.

(7) Acidosis and blood dyscrasias.

(8) Hypofunctioning thyroid (does not eliminate drug readily).

#### Advantages.

(1) Ease of induction.

(2) Better relaxation than is possible with other light anesthetics.

(3) Moderately prolonged post operative sleep.

(4) Reduction in post anesthetic nausea and vomiting.

(5) Small amount of inhalation anesthesia involved.

#### Administration.

The routine is as for any other anesthetic. A cleansing enema in the evening. Morphine one-sixth grain one hour before the operation and avertin one-half hour after morphine. In small children one may omit the enema as it makes no great difference. Avertin is obtained in a solution of anylene hydrate one c. c. containing one gram avertin with distilled water Q. S. to make a three per cent solution and heated to forty degrees Centigrade. The avertin in calculated dosage is added to the solution and shaken. Be sure not to heat the solution after the avertin has been added. A few c. c. of the solution is placed in a test tube and a few congo red 1:1000 added. If the color is unchanged, the enema is ready for use. Instillation is given in the patient's room. The patient is placed on his side in Simms position. A small rectal tube is passed six to eight inches. The solution is allowed to run in by gravity. If the patient is nervous, assure them that the procedure is only a test enema to be retained for a few minutes and by the time they realize the situation they are too drowsy to care.

#### Dosage.

As with amytol see the patient beforehand; males, thyroids, extremely nervous patients, children, fat patients require a large dose and old people, hypertensions require less than normal doses. Great pain naturally requires a large dose to induce sleep. The usual dose is eighty to one hundred mg. per kilogram body weight in a two and one-half to three per cent solution. The dose is usually six to eight grams. If the content is not sufficient to produce sleep add fifteen to twenty-five mg. per kilogram body weight, but such is not usually necessary.

#### Anesthesia During Operation.

Often operations of minor nature may be carried on without supplementary anesthesia. Before beginning the operation saturate a bit of gauze with ether and hold it before the patient's nose; with no change in respiration the operation may proceed without any further anesthesia, but if the patient coughs or holds the breath a supplementary anesthetic is required.  $N_2O_2$  is usually sufficient though ether may be necessary when relaxation is required. It is given slowly and when coughing occurs the amount is lessened. As a rule the amount required for major operations is one to three drams and is sufficient to give complete relaxation.

#### General Changes.

Nausea, vomiting and distention is infrequent. Post operative urine shows less acetone than with ether. There are slight blood changes. The fall in blood pressure is seldom

alarming if drug is used in moderate doses. As with amytol the greatest drop is in hypertension cases. It usually occurs fifteen minutes after sleep ensues and ranges from ten to thirty M. M. depending on age, original blood pressure and general physical condition. Fifteen minutes after the blood pressure drops there is a gradual return to normalcy. If delayed, adrenaline is given followed by ephedrine. The respiration is shallow, but the rate is normal or increased. Slight cyanosis may occur particularly in patients with preoperative morphine. Such cyanosis depends upon patient's condition, anatomy of air passages, and the dose of avertin. The pupils are contracted and react to light. Conjunctival reflex is absent, slight corneal reflex is present, and skin reflex intact.

#### Post Operative Care.

- (1) Morphine for pain.
- (2) Elevate foot of the bed about ten inches until patient is conscious to prevent shock.
- (3) Keep the jaw elevated.
- (4) With prolonged recovery give ephedrine or thyroxin.

#### RECTAL ETHER

An anesthesia produced by absorption of ether from the lower intestinal tract.

#### Indications.

- (1) Pulmonary conditions.
- (2) Obstetrics.
- (3) Surgery of the face, neck, brain, and spinal cord.

#### Advantages.

- (1) Access to face is difficult for anesthetists under inhalation anesthesia. Such is avoided by use of rectal ether.
- (2) The amount of ether compares favorably with that given by inhalation.
- (3) Anesthetists able to chart blood pressure, pulse, and respiration during the operation.

#### Technique of Administration.

Two days before the operation an aperient is given. The day before a light diet. In the morning enema and a bowel wash in the evening. On the day of the operation one and one-half hours prior to the operation the first injection is given consisting of chlorotone twenty grains, ether one-half ounce, paraldehyde two to four teaspoonfuls, paraffin one ounce, followed in forty-five minutes by second injection of seventy-five per cent ether in paraffin (ether six ounces, paraffin two ounces). The patient is drowsy before the second injection, in fact, may be sound asleep. Twenty minutes after the second injection the patient is sleepy, in thirty minutes he is asleep and anesthetic in forty minutes. Should there be any difficulty in the retention of the second injection, drop a few drops of chloroform on the mask and when the



mixture is being introduced let patient inhale and they relax and the solution runs in easily. Such an anesthetic affects all people differently and one cannot foretell when supplementary anesthesia may be necessary. Intra pharyngeal ether may be used but is rarely necessary. Anesthesia is light but at all times only an analgesia. The rate of absorption of ether is one and one-half to two ounces per hour thus such even absorption produces an even anesthesia without danger of overdosage. The patient is asleep, face flushed, breathing quiet, jaw seldom relaxed enough to obstruct airway. The pupils react to light, the pulse is slower than in inhalation anesthesia. Slight movements of the patient may occur. It has little effect on the blood pressure even after prolonged use. Generally a slight rise at first, then a drop to a steady level unless a shock or a hemorrhage occurs.

#### Post Operative.

The color is good. The pulse and condition of the patient is good. There is no exhaustion present. Sleep is from two to four hours. There is no vomiting and few respiratory complications and infrequent bowel complications.

#### SODIUM ETHYL METHYL BUTYL BARBITURATE (SODIUM EMBUTOL OR NEMBUTOL)

This drug is essentially an antispasmodic anesthetic. It differs from sodium amytol in that there is less delirium and the same effect can be produced by one-half the dosage. The period of recovery is only one-half as long and there is less restlessness. It is more valuable for preparing patients for operation because of its sedative value, consequently it is valuable in local anesthesia. The solution for intravenous use is 6.66 per cent or one gram to one c. c. The maximal dose is seven and one-half grains, the average dose is three and one-half grains. Sedation is obtained by giving one and one-half grains to four grains by mouth with one-sixth to one-fourth morphine by hyperdermic thirty-five to forty-five minutes before the operation. It may be given the night before and repeated in the morning one and one-half hours before the operation thus allaying fear and keeping the patient's tolerance normal for the anesthetic, and allaying serious morbidity and mortality incident to the administration of general and local anesthesia. In the Mayo Clinic during the year 1930 this drug was used more than sodium amytol and with better success.

#### SODIUM SECONDARY BUTYL BETA BROMALLYL BARBITURIC ACID (PERNOCTON)

A complex synthetic barbiturate which is less effective than sodium amytol or nembutol. It is used intravenously exclusively. Induction is rapid and similar to that of sodium amytol. The patient is sleepy, slow

in answering questions, quiet, natural sleep. There is no change in the pulse or blood pressure. The respiration is slow but the amplitude is greater. The pupils are the same as with sodium amytol. The jaw is relaxed necessitating an airway. The post operative sleep resembles normal sleep. Deep sleep changes to semi-consciousness and the patient can be aroused to answer questions and take fluids, but if left alone lapses into sleep. The memory of past events is nil when fully awake. Restlessness occurs only occasionally; rarely chronic muscular contractions of one to two hours duration. No delirium, excitement, hallucinations, respiratory or circulatory depression is present.

#### Determination of Dosage.

It is given in a ten per cent solution. It is put up in ampules of 2.2 c. c. each ready for injection. The average hypnotic dose is 4.5 grams, the average volume is only three c. c. It is given at the rate of one c. c. per minute for if given more rapidly it may cause toxic symptoms from precipitation of barbituric acid if the solution is thrown into the blood stream too rapidly. Bunn recommends one c. c. for every thirty pounds body weight with an average of four to five c. c. If morphine is given, the dose is necessarily reduced to two to four c. c.

As with other drugs discussed, worry, fear, pain, fever, nervousness inhibit the action of the drug and require larger doses. Such factors accelerate elimination and the effect produced is shorter. The dose as calculated is not so important, but the drug is given until the desired effect is obtained. Hypnotic doses should never be exceeded, and general or local anesthesia is used in all cases to supplement pernocton. The administration of the drug is given in the patient's room which is dark and quiet. The patient is placed in a comfortable position and relaxed. A preliminary of morphine is given one hour previously. The induction of supplementary anesthesia is smooth, relaxation is good, post operative vomiting is reduced. With the use of gas induction is very much simplified. There is good anesthesia and relaxation without anoxemia or additional ether. It is excellently used in conjunction with spinal or local and acts as a prophylactic and antidote for cocaine poisoning.

#### LUMINAL PHENOBARBITAL

This drug in new form of sodium luminal is rapidly soluble by oral or rectal route as well as by hyperdermic injection. The effect produced is sedative and antispasmodic. If the administration by mouth is not feasible, the contents of the capsules may be dissolved in water and given per rectum. It is not be used to produce sleep but enhances the use of either general or local. It reduces the amount of anesthetic required and prolongs

the effect of both.

Indications.

(1) Abdominal section requiring ordinary manipulation.

(2) Radical breast amputations.

(3) Toxie goitre eases.

(4) Rectal operations under luminal and gas.

(5) Local anesthetics:

(a) Removes psychic elements of injection.

(b) Antidote for novocaine.

(6) Use in spinal with caution.

(a) Patient may be unco-operative.

(b) The flow of spinal fluid is slow because of lowered blood pressure.

(c) Continued low blood pressure by both methods is objectional.

Advantages.

(1) Psychic dread is removed. The patient talks and is co-operative.

(2) The quantity and concentration of gas is lessened, thus cyanosis and bleeding is lessened and haemostasis is facilitated.

(3) The post operative sweating is practically done away with. The nausea is lessened and fluids are readily taken by mouth.

(4) There is a welcome post operative sleep of many hours.

(5) The nursing care is lessened.

(6) The range between therapeutic and the toxic dose is large.

Physical Changes.

The blood pressure drops in most cases ten to twenty M. M. It rises in some ten to twenty M. M. or more, and in a few hours there is no change. Lowered and unaffected readings occur frequently in both toxic and non-toxic cases. Seldom does the blood pressure vary in either direction less than ten M. M. The pulse and respiration is similar to cases prepared with other hypnotics studied.

Dosage.

Variations as to the type of individual judged as with other drugs discussed. The normal patient tolerates fifteen grams provided the blood pressure is not too low. A semi-anesthetic dose is given in milk powdered three hours before the operation after a preliminary of two to three teaspoonfuls of paraldehyde the night before the operation or chloral hydrate 10 to 15 grams. There are two methods of administration: Divided dosage, and single dose.

Advantages of Single Dose.

(1) More effect secured on the table and continued longer than in broken dose.

(2) Full soporific effect obtained when most needed.

(3) Cumulative risks avoided.

(4) Patient is not awakened repeatedly.

(5) The nurse is spared the responsibility

of judging patients need as with the broken dose.

Broken Doses.

(1) No preliminary of chloral or paraldehyde required the night before as with the single dose.

(2) If the patient is sensitive to the drug such an idiosyncrasy can be discovered and the drug discontinued.

The broken doses are administered according to the total dose required and the time of the operation in the morning. For instance: A total dose of fifteen grains is to be given. Three grains are given at nine and twelve p. m., three, six, and nine a. m. for a ten o'clock operation. When more than fifteen grains, say twenty-one grains, are given, the drug is given in seven doses of three grains each at three hour intervals—two five, eight, and eleven p. m., and at two, five, and eight a. m. This brings the patient partly wakeful and rational to the operating room. They feel dozey, but talk intelligently and are cognizant of their surroundings, but apparently evince no interest.

In toxic goitre cases the dosage depends upon the basal metabolic rate.

Plus twenty give eighteen grains.

Plus thirty-five give twenty-one grains.

Plus fifty give twenty-four grains.

If the patient is particularly unruly give twenty-seven grains.

Post Operative Phase.

A great majority of patients have no need of a post operative sedative, but that small group which had insufficient luminal at the time of the operation may be given one and one-half grains of luminal every four hours for 5 doses or as long as restlessness or complaining occurs. If pain is present pyramidon is given, but give five grains every four hours to avoid the use of morphine. The ordinary duration of anesthesia with this drug lasted twenty-six hours in the average individual with variations in the others from six to eighty hours. If morphine is required, the amount and frequency of its use is much less frequent than otherwise. Morphine should be used for true post operative pain, but such factors as uncomfortable position, desire to sleep, headache, aching bones and joints, gas pains, bladder tenesmus or nervousness can be taken care of by a good nurse and analgesics. Morphine is, however, of definite value in toxic goitre cases, and excitation and nervousness after luminal. Again before giving morphine use restraint, have a quiet, darkened room and a soothing, soft-voiced attendant.

Untoward Effects. Rarely Manifested.

(1) Difficult to get deep, surgical anesthesia because of depressed respiration.

(2) Diplopia, vertigo and haziness of vision in some cases.



## CONCLUSIONS

(1) Preanesthetic medication in some form should be used prior to every anesthetic whether general, local or spinal.

(2) Sodium amytol intravenously, avertin rectally, should be used only in specially selected cases.

(3) That for ordinary clinic work where one operation follows another intravenously, sodium amytol, avertin, rectal ether, pernocton are too time-consuming to be of practical value.

(4) That such drugs should be used only as basal anesthesia and should never be used to approach the state of general anesthesia as there is too narrow a margin of safety between the dose causing real anesthesia and that depressing the medullary centers.

(5) That barbitol is as effective as any of its derivatives as a preanesthetic agent and is cheaper.

(6) Proper preanesthetic medication lessens concentration of inhalation gases and ether, and increases the amount of oxygen component thereby avoiding anemia, increases smoothness of induction and course of anesthesia.

(7) Preanesthetic medication is a distinct aid to the patient in that he is spared pre-operative fear, anxiety and worry and that he is given the better conduct of the anesthetic and many comfortable post operative hours.

(8) That the proper psychic approach to the patient is a valuable adjunct to pre-anesthetic medication.

(9) That patients vary as to their reactions to various drugs and various dosages according to race, temperament, age and general condition.

(10) Avertin and sodium amytol need constant careful supervision in administration.

(11) That all drugs decrease post operative nausea and vomiting, gas pains and other post operative complications.

(12) Avertin produces more muscular relaxation than sodium amytol and other products, but is more toxic and has a more limited field of usage.

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## DISCUSSION

J. R. Wathen, Louisville: I think it is time for us to distinguish between the barbituric salts. The great trouble has been the confusion. We think they are all one and the same, but there is a great distinction between them. The chemical composition is very similar. None of them is an anesthetic; they are simply sedatives. As regards luminal and veronal and nembutal and amytal there is a wide distinction. In the first place, luminal is a phenol preparation, contains carbolic acid, is irritating to the stomach and leaves the patient in a dizzy condition. If you give much luminal they will get up and reel around the room. It is a bad preparation for that reason. Luminal has been used a good deal to decrease hypertension cases where the blood pressure is high. It will reduce the blood pressure decidedly, but that is a disadvantage. In some cases where we have a low diastolic blood pressure, where there is auricular fibrillation, for instance, it is a serious thing to give luminal, but much to advantage you can use veronal.

Amytal lowers blood pressure. Amytal is being used now entirely by the cardiorenal men who make a specialty of electrocardiographic work. They recommend a grain and a half of amytal in preference to luminal to reduce blood pressure. That is an important point for it does not reduce the blood pressure rapidly.

The best preparation, in my opinion, of all these pre-anesthetic types of preparations is veronal, and the elixir is better than the tablets. So many anesthetists give a tablet an hour or two hours before; it will stay in the stomach; it is only soluble in acetic acid. There is no use trying to give them a tablet of veronal, but give the elixir of veronal that has been dissolved in a preparation of acetic acid, and it is readily absorbed either by the rectum or by the stomach. It does not decrease blood pressure, but in fact it holds the blood pressure just about where it would naturally be. That

is a very important point.

Of all those barbituric salts there is only one that acts upon the vomiting center of the brain, and that one has been proven to be veronal. That was found out by the Bureau of Standards in connection with some experimental work that the Navy asked the United States Government to perform to find out what would prevent nausea and sea sickness, and the transatlantic steamers now are using it. The Government highly endorses it. Veronal can be used so nicely in the form of an elixir; it is the only drug acting on the vomiting center of the brain. Another very important thing is that it is not followed by a headache. If you use luminal or amytal, so often there is an intense headache following its administration, which is a very important point.

As regards nemutal, put up by Abbott, I have never gotten any results from it at all. I simply arise to condemn it.

Amytal is a good preparation. If you use sodium amytal in the form injected into the veins, slowly, it puts the patient sound to sleep. That is not what we want in most anesthetics in connection with local anesthesia, especially goiter work. You want the patient to be still conscious, but to be drunk, to be drowsy, you want to be able to talk to them and to see if you are injuring the recurrent laryngeal nerve.

There is a wide distinction between amytal, luminal and veronal, between all of them, and I think we should use them with caution for the reason that we should understand the physiological action of those drugs.

**A. D. Willmoth, Louisville:** This paper and the last one on the program this afternoon are two very important papers, both to the surgeon and the practitioner who has to do with the case before it is operated on, and perhaps afterward.

Pre-medication of the patients has much to do with the operative work and also the post-operative recovery, that is at least for the next few hours.

I want to call your attention to the drugs that the Doctor mentioned. Personally, in my own work, for a number of years I have used morphine and atropine—atropine for the purpose of drying up the secretions in the mouth, usually 1/125 of a grain to the adult, and 1/6 of a grain of morphine to the average adult. I have never had but two patients in a number of years in whom the respiration was slowed down by the action of the opium. If there is any known drug that is favorable to shock it is morphine; that is the one that you would think about, and if you have the patient under the influence of it, unless there is some contraindication you certainly are, in a way, combating the shock.

There is one point I want to call to your attention, and that is with reference to amytal.

Personally I do not use it. Why? Just remember, gentlemen, that it is not an accepted drug, that it is in its experimental stage, and if you have an accident it is just too bad, you haven't any defense, you are giving a drug that is not accepted as an official preparation, and for that reason I don't use it. I know there are plenty of good men who use it, better men than I am, perhaps, but I just like to play safe, and want to again call your attention to the fact that it is not an accepted preparation.

Since the title of the essayist's paper was pre-medication, I think that it does the patients good to alkalinize the system before they are given an anesthetic and operated upon. Perhaps all of you are familiar with the work of Matas, I think it was, who gave, just following the anesthetic, before the patient left the operating table, a bottle of Coca-Cola through a tube, washing out the stomach through a small tube and introducing the Coca-Cola at once. He got the effect of the carbonic water, the effect of the alkalinity; and the effect of the glucose, and he got the effect of the liquid, which was desirable. Personally I have never tried this, but for a number of years I have alkalinized the patient's system. It doesn't matter whether you do it with Kalak water or bicarbonate of soda or any alkaline preparation you want to use, but I am thoroughly convinced that if you will alkalinize your patient it will take a little longer to prepare your case but the time is well spent in the hospital, because eventually it shortens the time after the operation. You will be surprised how few patients will have nausea and vomiting following anesthetics if you will take the trouble and the time to explain to the patient that you want just about twelve hours more time to prepare them for the operative work. I know how it is with all of us—they come in tonight at eight o'clock and want to be operated on at seven in the morning. If you can explain to them that if they will just give you one more day you can reasonably assure them the time will be short in the post-operative part of the case and it will be of great advantage. Alkalinize that patient's system by any method that you are familiar with, that you like or prefer, and you will be surprised how few patients will have post-operative vomiting.

**M. Casper, Louisville:** No two surgeons or anesthetists have the same drug or method for anesthesia, but we are meeting here in the shadow of the great Henry Clay who was a great compromiser, and I offer as a solution my way of using it, not giving one drug, but giving a combination of several of them. I use both Dr. Wathen's veronal or luminal and Dr. Willmoth's morphine and atropine, and I find it works very admirably because you do not have to have an excessive dose of either. After all, these drugs all belong to the depressant class, and many times, too large a dose is given of a particular drug and it depresses the patient.



I disagree with Dr. Wathen a little about luminal. I use both luminal and veronal. It does give you a certain species of delirium or drunkenness, or whatever you want to call it. These patients sometimes talk peculiarly or irrationally, but I find it does not depress.

I think one of the greatest things in the way of pre-anesthesia medication, you might call it, is the use of ephedrine, especially with spinal anesthesia. That helps maintain your blood pressure and is a great agent. Some say that ephedrine is contraindicated, but I belong to the class that thinks it is one of the greatest advances we have had in conjunction with spinal anesthesia.

One other thing I would like to urge, that you have your intravenous outfit ready in using spinal anesthesia. If you do that and keep the patient's head low, you will have very little mortality.

**Harper E. Richey**, (in closing): The object of my paper was to give some recent advances, not some that had been used for years and years. Morphine and atropine are certainly easy to give, and it is very easy for the surgeon or anyone, but from giving a number of anesthetics I have found that it depresses the respiration a great deal, and the induction of anesthesia is prolonged. Post-operatively you have a lot more nausea, vomiting constipation, disturbance of your basal metabolic rate and basal metabolism generally.

Luminal I mentioned in my paper, but I did not have time to elaborate upon. It has been used extensively by the two Bartletts of St. Louis. They think it is ideal because of the fact that the patient is brought to the operating room co-operative, and yet so drowsy that he doesn't care about the procedures going on around him.

Sodium amytal is not used so extensively in this state. In Louisville a number of the men have used it. I talked to Dr. Spurling about it in his brain work, and he said it was unsatisfactory because of the intense restlessness that the patient had on the operating table.

In my work I have used a great deal of nembutal, and I am very well satisfied with it. I have used some avertin and that gives an ideal sleep. I gave the dosage in my paper. Dr. Dandy has used as high as 125 milligrams to a dose but the average is 90-95 mg. Of course, all these drugs are dangerous to some extent if not used properly. The dose has to be determined for the individual patient. You can't give every patient the same dose.

Of course, in spinal anesthesia, as mentioned by Dr. Casper, we always give ephedrine. We never yet have had to use any intravenous treatment on the operating table. Perhaps afterward we may have some reaction, but not from the spinal anesthetic; it is due to the operation itself.

I think these drugs are of definite value. We

ought to think more of our patients. We think of the operation at hand, getting the patient in the operating room and getting the operation over and the patient back safe to his room, while this is important we should think more of the comfort of the patient, the anxiety before going to the operating room and in the operating room. If they are drowsy with proper preanesthetic medication, they are going to have a comfortable operation in the operating room and a comfortable two or three days post-operatively, which is the most important time to them.

## THE OCULAR MANIFESTATIONS OF SYSTEMIC DISEASES\*

LEO JACOBS, M. D.

Covington.

### INTRODUCTION

It was with the invention of the ophthalmoscope by Helmholtz in the 19th century that ophthalmology became an exact science. Before that time all ocular work was done by the general physician. Since then, more and more of the ocular work has been referred to the specialist until now a wide chasm separates the daughter and the mother science.

The disadvantages of such a state of affairs are manifest. The ophthalmologist is often prone to look upon the eye solely as an optical apparatus without seeing the patient as a whole, and the general physician often fails to evaluate any optical changes present in a disease which might be of aid to him in making a diagnosis or prognosis of that disease.

Hence, the chief aim of this paper is to recall and re-evaluate those ocular changes that occur in various systemic diseases so that there may be a closer co-operation and a better understanding between the ophthalmologist and the general practitioner.

### INTERCRANIAL LESIONS

Intercranial lesions are oftener accompanied by ocular manifestations than any other group of diseases. This is due to the fact that the eye is morphologically an "off shoot" of the fore brain and in life is directly continuous with it.

An analysis of all intercranial lesions will roughly fall into two groups:

1st. Those lesions which directly or indirectly cause an increase in intercranial tension by impinging upon the existing space in the bony skull, and

2nd. Those lesions which are due to degenerations of the brain tissue with a replacement of it ultimately by fibrous tissue. In this second group we find notably Tabes and multiple sclerosis.

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

In the group where the increase of intracranial tension is brought about we find more commonly the following: The meningitides; encephalitis in some cases; all types of brain tumors and abscesses; Tuberculomas; gummas; cerebral hemorrhage and hydrocephalus. In this group the ocular and systemic symptoms are due in the greatest part to the increase in tension.

The significant ocular manifestation of an increased pressure is the choked disc. This choking or swelling of the optic nerve head occurs early in the rise of the pressure and if allowed to persist, will finally cause an atrophy of the nerve with complete blindness.

Should a tumor begin in the pituitary gland or along the optic nerve pathway we will find, due to the pressure on the nerves, a loss of part of the visual field of one or both eyes. This occurs before the tumor has grown to be large enough to produce signs of an increase in the intracranial pressure. When the tumor does produce pressure signs we find in the eye a choked disc superimposed on the visual field derangement.

In people who suffer from headaches it is imperative for us, if no suitable explanation can be found, to have a fundus examination and a mapping of the visual fields made. In this way we will make diagnoses of intracranial lesions much oftener than heretofore.

Tabes and multiple sclerosis commonly show an optic atrophy which usually progresses. Nothing can be done in the case of multiple sclerosis. Vigorous antiluetic therapy is indicated in the Tabes in an effort to arrest this loss of vision. Tryparsemide should never be used in Tabes unless the eyes are perfect, as sudden blindness has often occurred in patients where there were ocular abnormalities prior to treatment.

#### FOCAL INFECTIONS

Focal infections produce a greater percentage of the serious ocular manifestations than any other cause. Theoretically, clinically and in some cases experimentally the voluminous literature of the world proves that all parts of the eye may be attacked by the bacteria or toxins from a focus of infection. It also proves that the teeth as offenders, occur about eight times more often than any other source of infection. Then following in order of frequency are the tonsils; sinuses; gall bladder; lower intestinal tract; the prostate in the male and the pelvic organs in the female.

Bacteriologically it has been found that the underlying organism were the streptococcus hemolyticus; the streptococcus viridan; the staphylococcus albus and the staphylococcus aureus.

Clinically, the iris and choroid are generally the sites of pathology when the lesion is due to a focus of infection. The retina,

owing to its close connection with the choroid suffers in the choroidal involvement. The course of the disease is slow and the inflammation is as a rule, low grade. The eye does not respond at all well to local treatment and exacerbations are frequent until the focus has been located and removed.

It has been our custom in all cases of iritis, choroiditis and retinitis to have the teeth examined by a dentist; a blood Wassermann and a thorough physical examination done by the family physician. It is by these routine procedures that we are surest of coping with the disease.

#### MENINGITIS (EPIDEMIC)

Randolph states some forty years ago that every extensive epidemic of meningitis was apt to be associated with a special type of eye infection.

Sinclair called attention to the fact that epidemics of meningitis vary greatly in severity of symptoms and in complications.

In Lewis' series of cases the outstanding ocular manifestation was a hyperemia of the optic nerve and retina.

In Uthof's series the predominating lesion was a conjunctivitis.

In Randolph's series the leading complication was a great engorgement and tortuosity of the retinal veins and engorgement of the disc.

In an epidemic some years ago squint occurred most often.

Few changes are observed in the eyes that are of any diagnostic importance. In a small percentage of cases the reflex activity was lost. The pupils dilate late in the disease.

As a rule the eye complications clear up spontaneously. This is particularly true of the strabismus, although it may take some time. Lewis thinks that we should wait at least a year or two after recovery from the meningitis before the surgical treatment of squint should be considered.

#### SYPHILIS

Both the acquired and hereditary forms of syphilis present ocular manifestations.

Interstitial Keratitis is the distinctive eye lesion of hereditary syphilis occurring in at least 52% of the cases. The corneas of both eyes are usually affected in succession. The symptoms may be mild or severe; inflammation taking weeks to reach its height and then slowing receding, leaving opacities in the cornea. Anti-luetic treatment should be vigorous.

Primary luetic lesions of the eye are rare.

In the late secondary stage we often see an iritis. This iritis appears as a rule between the sixth month and the second year after infection. Syphilis is the etiological factor in at least 30% of all cases of iritis. Anti-luetic therapy together with the local



instillation produces a prompt recovery.

In the tertiary stage syphilis affects the optic nerve and retina causing a marked neuro retinitis with subsequent progressive loss of vision. No recovery is possible after the optic nerve has been injured but anti-luetic treatment should be instituted to improve the general condition.

#### TUBERCULOSIS

Although we know that no part of the eye is immune to a tuberculous infection, it must be admitted that ocular troubles, in America, caused by Tuberculosis are rarely found among people suffering from an active and frank pulmonary tuberculosis.

At the same time known tuberculous lesions of the eyes have been demonstrated by the pathologist in people who were clinically free of tuberculosis.

Drs. Goldenburg and Fabricant, in their recent survey of the patients in the Municipal Tuberculosis Sanitarium of Chicago arrived at the conclusion that tuberculosis of the eye is much less encountered than the literature would have one believe. Only 1/5% showed changes in the iris and 2% showed changes in the fundus. The fundus lesion was always unilateral and in any given case only one area of the field showed the presence of a tubercle, either healed or unhealed. When healed this area was replaced by scar tissue.

#### DIABETES

The ocular manifestations of diabetes occur most commonly in elderly people, especially, where the disease has been of long duration and not in the young where the disease assumes an acute form.

The most common ocular manifestation is an everchanging refraction which runs parallel with the concentration of blood sugar. Thus, the greater the percentage of blood sugar, the greater the near sightedness.

That this disease may cause the formation of a cataract is well established, both clinically and experimentally. The exact mechanism of production is unknown. But, if the disease is treated early and vigorously the progress of the cataract will cease and there may occur a clearing up of the opacity.

Passing mention should be made of the extreme softening of the eyeballs in diabetic coma.

Retinal lesions occurring in diabetes do so usually late in the disease.

Ophthalmoscopically one sees small punctate hemorrhages and chalky dots in the macular region. Although, this is an unfavorable prognostic sign as far as the vision is concerned, it does not have the same serious significance toward life as the hemorrhages that occur in an albuminuric retinitis.

#### PREGNANCY

The early recognition of ocular disturbances during gestation is of greatest impor-

tance since these are frequently warnings of marked systemic changes that menace not only the eyesight of the woman but also her life. The ocular disturbances according to Woods are:

1. The sudden amaurosis called uremic, which is thought to be due to the action on the visual centers by a toxin and which usually clears up spontaneously with the general improvement.

2. Loss of vision in some sector of the field without retinal lesion and is thought to be due to hypertrophy of pituitary which exerts pressure on the optic nerve.

3. The retinal lesion known as an retinitis of pregnancy and the ophthalmoscopic signs of this retinitis may not differ from those associated with other nephritides. Here it is due to a toxemia. Prognosis of this condition depends on the duration of pregnancy. The later they appear in the course the better the prognosis as to the conservation of vision.

Detachment of the retina is one of the unusual complications of pregnancy and the chances of perfect vision after detachment during parturition seems to be better than in the non-puerperal state.

#### NEPHRITIS

In 1827 Bright called attention to the loss of vision accompanying some cases of nephritis and in 1856 the retinal changes were first observed by Heyman.

In the great majority of nephritis there is no accompanying retinitis. When present it is found in people usually between the ages of forty and fifty. It is very seldom observed in children. It occurs in males about two and one-half times as frequently as in females and occurs in any and all types of nephritis and nephrosis.

Clinically it, as a rule, occurs in both eyes. The loss of vision is usually slow, rarely rapid and comprises a greater or less loss of visual acuity without, as a rule, contraction of the field of vision and without loss of color and light sense. Complete blindness is rare. If it occurs suddenly in both eyes an uremic amaurosis is to be suspected.

Ophthalmoscopically we find glistening white spots in the macular region, where they sometimes form a stellate figure, accompanied by hemorrhages from the retinal vessels. These hemorrhages vary in size and location and tend to recur time and time again. In a small percentage of cases the nerve head is involved.

Formerly it was thought that the changes in the retina were dependent per se upon the renal lesion. Today we know that this is not true for we see too many cases of nephritis without any fundal changes. We think it is due to pathological changes of the retinal vessels which have been induced by a

severe toxemia or fatty degeneration.

With this explanation in mind, it is evident that the presence of a so-called albuminuric retinitis indicates a serious prognosis for the life of the patient.

The only treatment is systemic in nature but is usually without avail.

#### CONCLUSION

Although I have only discussed the commoner systemic diseases, may I assure you that in nearly every systemic disorder there usually occurs some ocular change which, if closely studied, will often give invaluable aid in diagnosis, prognosis and treatment of the underlying condition.

#### BOOK REVIEWS

**GONORRHEA IN THE MALE AND FEMALE.**—By Percy S. Pelouze, M. D., Associate in Urology and Assistant Genito-Urinary Surgeon at the University of Pennsylvania; Fellow of the Philadelphia College of Physicians, Philadelphia, Pa. Second Edition, Revised. 440 pages with 92 illustrations Philadelphia and London: W. B. Saunders Company, 1931. Cloth, \$5.50 net.

The first edition of this book went through five large printings. Now comes a new edition (the second) — enlarged, improved, brought up to date, new chapters added, new sections, notably that on Gonorrhea in the Female.

The entire book has been reset because of these many additions, including local medication of the urethra, treatment of acute anterior urethritis, gonorrheal arthritis, treatment of periurethritis, phimosis, paraphimosis, balanoposthitis, lymphangitis, phlebitis, lymphadenitis, folliculitis, follicular abscess, parafrrenal abscess, paraurethral sinusitis, gonorrheal ophthalmia. A number of new illustrations, some in colors, have also been added.

This is a common-sense, straight-forward, fearless presentation of gonorrhea in both Male and Female—its prevention, diagnosis, management and treatment.

**THE SURGICAL CLINICS OF NORTH AMERICA.** (Issued serially, one number every other month.) Volume 11, No. 4, (Mayo Clinic Number—August 1931). Octavo of 211 pages with 74 illustrations. Per clinic year, February, 1931 to December, 1931. Paper, \$12.00; Cloth, \$16.00 net. Philadelphia and London: W. B. Saunders Company, 1931.

**INTESTINAL TOXEMIA (AUTOINTOXICATION) BIOLOGICALLY CONSIDERED.**—By Anthony Bassler, M. D., F. A. C. P. Consulting Gastroenterologist, St. Vincent's, Peoples' and Jewish Memorial Hospitals, New York City; St. John's Hospital, Yonkers; Christ Hospital, Jersey City. Courtesy Physician, Knickerbocker, Neuro-pathic, Fifth Avenue and Pan-American Hospital, New York City. Formerly Professor and Director of the Department of Gastroenterology and Visiting Gastroenterologist, New York Polyclinic Medical School and Hospital. Formerly Professor of Gastroenterology, Fordham University Medical School. Fellow The American College of Physicians and New York Academy of Medicine. Ex-Chairman Section of Gastroenterology and Proctology, American Medical Association. Member American Medical Association and Medical Societies of the State and County of New York, American Roentgen Ray Association, New York Gastroenterological Association, American Therapeutic Society, Internal Secretion Association, etc. Author Text Books Diseases of the Stomach and Upper Alimentary Tract, and Diseases of the Intestines, Liver, Gall-Bladder, Pancreas, and Lower Alimentary Tract, etc.

Illustrated with 16 text cuts. F. A. Davis Company, Publishers. Philadelphia. \$6.00 net.

This volume is the result of a constant study of over five thousand cases extending over a period of thirty years. The results are estimated after the termination of the treatment. The various intestinal organisms that contribute to intestinal toxemia are listed and described, the dietetic treatment is also included, which contributes greatly to the value of the book.

**Prognosis of Pulmonary Tuberculosis Detected in Apparently Healthy Persons.**—Investigations on 1,688 patients with open tuberculosis convinced Braeuning that about 70% of such patients die as the result of open tuberculosis. He also found that only about 15 per cent of the cases of open tuberculosis are recognized before they become open. Consequently the fate of the majority of patients with open tuberculosis is already sealed when the tuberculous process is discovered. This shows how necessary it is that tuberculosis be recognized earlier. But, since incipient tuberculosis cannot always be detected by percussion and auscultation, roentgen examination is necessary. The author realizes that it is not possible to keep the entire population under constant roentgen control, but he stresses the necessity of observation of those groups that are predisposed or exposed to tuberculous infection.



# Kentucky Medical Journal

Published Monthly By

THE KENTUCKY MEDICAL ASSOCIATION  
Incorporated

Entered as second class matter October 22, 1906, at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price .....\$5.00  
Edited Under Supervision of the Council

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NEXT MEETING LOUISVILLE

## COUNTY SOCIETY REPORTS

**Bullitt:** At a special meeting of the Bullitt County Medical Society held at the court house in Shepherdsville, on January 26, Realizing that the deaths following child birth in a great many instances can be prevented, We the Members of the Bullitt County Medical Society, wishes to go on record, in adopting the following resolutions.

First, Statistics show that a number of cases who develop certain diseases during pregnancy and following child birth can be prevented by consulting a competent physician when the woman first realizes her condition.

Second, We wish to remind all organizations that are allied with this movement to teach and urge upon the prospective mothers the necessity of keeping in close touch with her family physician, so he can guide her through the months of pregnancy, and bring her to the trying ordeal of child birth in good healthy condition, and thereby lessen the chances of developing some of these diseases.

Third, We realize that to bring the mother through the months of Pregnancy in a good healthy condition, means a more perfect developed child and less financial outlay for those who have to furnish it, this should be brought to the attention of the laity in the most emphatic manner.

Fourth, It is an altruism that the medical profession is constantly working to teach people how to take care of themselves, and to do this successfully they must have the cooperation of the ones who are to be benefitted thereby, and the prenatal cases are the ones that this altruism should be most emphatic.

Fifth, We commend the Ladies Home Journal and any other magazine that sponsors a move in the interest of so vital and far-reaching subject.

S. H. RIDGWAY, Secretary.

**Franklin:** The Franklin County Medical Society met in regular session in the Writing Room of the Capital Hotel at noon Thursday, January 7th, 1932.

Members present were: Drs. Coleman, Jackson, Travis, Minish, Lyon, Ginn and Youmans.

In the absence of the President, Dr. Heilman, Dr. Minish was asked to preside. Dr. Ginn, who had charge of the program, asked to be allowed to postpone his paper until the next regular meeting in February.

Some few clinical cases were discussed by Drs. Travis, Minish and Coleman. Dr. Coleman made a motion which was seconded by Dr. Travis that the Society invite the physicians connected with the General Assembly to meet with us at our next meeting, February 4th. The Secretary was requested to invite each one by letter. This meeting to be held at 5:30 p. m. followed by a dinner in the Hotel.

No other business, the Society then adjourned to the Hotel Dining Room for lunch.

C. E. YOUMANS, Secretary.

**Greenup:** The regular meeting of the Greenup County Medical Society was held on December 11, 1931. The meeting was called to order by the president, Dr. H. T. Morris.

Those present were: Drs. H. T. Morris, L. C. Richmond, H. H. Holbrook, W. H. Joyner, and C. B. Johnson.

Discussion by L. C. Richmond.

The program:

(a) Paper read by W. H. Joyner

(b) Discussion on Treatment of Carbuncles.

There was a motion made and seconded for adjournment.

CHAS. B. JOHNSON, Secretary.

**Hopkins:** The Hopkins County Medical Society meet at 6:30 on the evening of November 14, 1931, at the Madisonville Country Club. There were thirty-five members and guests present.

Dr. M. S. Veal was elected President of the Society, and Dr. D. L. Salmon, Secretary-Treasurer. It was voted that the regular meeting be held on the first Thursday of each month.

The Society had as its guests and speakers: Dr. Glenn Spurling, Louisville, Kentucky, on "Head Injuries and Their Management," and Dr. Barnett Owen, Louisville, Kentucky, on "Fractures of the Hip." The papers were interesting and instructive and a liberal discussion followed their delivery.

There being no old or new business the meeting adjourned.

DAVID L. SALMON, M. D., Secretary.

**Letcher:** The Letcher County Medical Society was held in Whitesburg, on Tuesday, Dec. 29, 1931. The following physicians were present:

Edwin F. Sheppard, Jenkins; T. M. Perry, McRoberts; H. R. Skaggs, Fleming; Virgil Skaggs, Fleming; D. V. Bentley, Neon; Can M. Bentley, Neon; T. M. Radcliffe, Kona; B. F. Wright, Seco; Thomas Jennings, Whitesburg; B. C. Bach, Whitesburg; John W. Combs, Whitesburg; R. Dow Collins, Whitesburg.

Dr. Edwin F. Sheppard read a very valuable paper entitled "Sub-phrenic Abscess" which was discussed by many of the other doctors.

The following officers were elected for the year 1932:

President—H. R. Skaggs.

Vice-President—John W. Combs.

Secretary Treasurer—R. Dow Collins.

A motion was made and passed changing our regular meeting nights to the last Tuesday in each month.

Dr. Thomas Jennings, the retiring President, made a very eloquent as well as sympathetic farewell address.

There being no other business the meeting adjourned.

R. DOW COLLINS, Secretary.

**Jefferson:** The March program of the Jefferson County Medical Society will be as follows:

March 7th

#### Symposium on Lobar Pneumonia

1. Diagnosis of Lobar Pneumonia, J. Murray Kinsman, M. D.

2. Newer Methods in Treatment of Lobar Pneumonia, H. R. Leavell, M. D.

3. Complications of Pneumonia, W. F. Bog-gess, M. D.

4. X-ray in Diagnosis of Lobar Pneumonia, Sydney E. Johnson, M. D.

Discussion to be opened by Drs. J. Rowan Morrison and R. Hayes Davis.

March 21st

#### Clinical Pathological Conference

1. Case Report and Clinical Findings, W. I. Hume, M. D.

Post-mortem Report and Pathological Findings, John D. Allen, M. D.

2. Case Report and Clinical Findings, E. K. Mc Lain, M. D.

Post-mortem Report and Pathological Findings, Harry M. Weeter, M. D.

3. Case Report and Clinical Findings, By a Member of the Hospital Staff.

Post-mortem Report and Pathological Findings, A. J. Miller, M. D.

GUY AUD, President,

ULY H. SMITH, Secretary.

**Bourbon:** The Bourbon County Medical Society met on Thursday, January 21st, 1932 at eight p. m. The meeting was held in the County court house, Paris, Kentucky.

The minutes of the preceding meeting, (December 17, 1931) were read and approved.

Members present: Drs. J. C. Hart, H. M. Boxley, J. A. Orr, L. Oberdorfer, J. T. Van Sant, C. G. Daugherty, and M. J. Stern.

Visitors: Drs. Esie Asbury and C. E. Wooding, Cincinnati, Ohio. Drs. Charles Garr Pennington; W. M. Brown and Farra Van Meter, Lexington, Kentucky.

Dr. Blenker, being favorably reported by the Board of Censors was elected a member of the Society.

Dr. E. Asbury read a paper on "Simplified of Fractures" explaining Bohlrs method where plaster casts are applied directly to the skin.

The discussion was opened by Dr. Chas Garr, Dr. W. M. Brown, followed by Drs. Farra Van Meter, C. G. Daugherty, J. A. Orr and closed by the essayist.

Meeting adjourned.

M. J. STERN, Secretary.



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BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. 30 No. 4

BOWLING GREEN, KY.,

APRIL, 1932

## EDITORIALS

### WHAT THE PUBLIC SHOULD KNOW ABOUT CHILDBIRTH

The above is the title which Dr. Walker Bourne Gossett, Louisville, gave to his book which was published last August by The Midwest Company (publishers) Minneapolis, Minn. This book has not only caused a great deal of comment from the United States Press, both medical and lay, but even in foreign countries.

The following is translated from the Dutch, printed in the *Nieuwe Rotterdamsche Courant*, Woensdag 9 September, 1931. *Avondblad B.*:

"The appearance of this book is very noteworthy, since the writer must have had courage in order to bring into light the shrill truths, which exist in the sphere of obstetrical aids in the U. S. A. The writer, who, himself has had twenty years of experience, did not wish that the American public should remain ignorant any longer concerning certain facts, which up to the present time, have not been known. Thus he claims that America is twenty years in arrears compared to other countries as regards death fatalities on child bed. The mortality during pregnancy delivery is astonishingly high. Gossett then continues to give a short history of obstetrical practice from folk lore in the sphere of pregnancy and birth, of the different means which are used at present to ease bodily pains during childbirth. He tells of the care before and after birth and proposes questions connected therewith. It is a book which will undoubtedly be well read in America where similar subjects are continually treated (discussed) in popular periodicals as *The Ladies Home Journal* and *The Parent's Magazine*. Also the chapter on moral issues in relation to obstetrical and surgical practice in Roman Catholic hospitals will be of great importance."

One of the most interesting reviews of this book was written by one of the leading obstetricians in this country, Dr. Palmer Findlay of Omaha, Neb., Chairman of the Subcommittee on Obstetric Teaching and Education of the White House Conference on Child Health and Protection, 1931:

"The lay public has need of authoritative information on the subject of childbirth and

Dr. Walker B. Gossett has made a praiseworthy contribution in his little book which appears under the rather alluring title, "What The Public Should Know About Childbirth." The initial chapter deals with the historical romance of midwifery and follows with a discussion together with numerous references to authoritative statements on maternal mortality and morbidity. The public has a right to know that there is no country in the civilized world where it is quite so hazardous to child-bearing as in the United States. This is so for many reasons referred to by the author. We are remiss in our educational system. Medical students, graduates of medicine, nurses, midwives and the lay public are not sufficiently informed with the result that enlightened co-operation is lacking and women and babies suffer in consequence. Superstitions and all manner of vagaries have from the beginning of time been associated with childbirth. It is so today. The chapters on Superstitions and Customs and on Maternal Impressions contain much of absorbing interest. The author very properly denounces twilight sleep and commends nitrous oxide for the relief of labor pains. A well-ordered maternity hospital is the safest place for child-bearing. This the author has clearly set forth.

Prenatal care when efficiently directed by a competent physician will more than halve the mortality of childbirth; it is preventive obstetrics of the highest order and the author has rightfully stressed this important feature of obstetric practice. It is here that intelligent co-operation between patient and doctor is imperative if more mothers and babies are to be saved from injury and death.

The subject is not presented in a sensational manner but rather in a logical scientific manner and yet free from confusing technicalities. The public may well profit by such a work."

In the chapter on Ophthalmia Neonatorum, Dr. Gossett cites the Kentucky Statutes and gives in full a circular that was issued by the Kentucky State Board of Health and signed by Dr. J. G. South, President and Dr. J. N. McCormack, Secretary.

In closing we can endorse what Dr. W. T. McConnell stated in his review of Dr. Gossett's book: "Beyond any question if every layman and doctor on this continent would read and heed this book, our distressing ma-

ternal and new-born death rate would be cut in half."

### THE POST GRADUATE COURSE

The two weeks course of Post Graduate instruction will be held in the early part of June. The attendance upon these courses has been increasing each year and they seem to meet a real need of the profession. This year Dr. Charles Hibbitt has been appointed Chairman, and Dr. John Wathen and Dr. John Walker Moore are to be associated with him. They have made a number of changes in the subjects which will be discussed so as more completely to answer the needs and interest of the doctors who have been attending the previous courses. My duties in connection with the State Medical Association are so heavy that I find it necessary to put this important project into other hands. I am glad we have been able to secure such ideal men to carry on the work.

PHILIP F. BARBOUR.

### HAVE YOU PAID YOUR DUES?

Members of the Association who have not paid their dues for the current year are urged to send in their remittances to reach us not later than April 1st. The postal laws make it mandatory upon us to drop the names of all who are in arrears at that date. It is very important for physicians to keep themselves in good standing, both in their respective local societies and in the State Association. Several instances could be cited where carelessness or negligence in this particular has proved extremely costly in the shape of attorney's fees for defense in suits charging malpractice. From the standpoint of economy alone, membership in good standing is worth many times the outlay entailed; the professional value of contacts so maintained is incalculable.

### ROBERT KOCH, MASTER OF RESEARCH AND BENEFactor OF MANKIND

Nestled in the Harz Mountains, in the German Province of Hanover, lies the little village of Klansthal. There, in 1843, was born Robert Koch, a man destined to influence the world of science more than most people realize.

Doctor Robert Koch was a great man, not alone in the community in which he lived. His greatness was destined to reach far beyond the realms of his native province, across the borders of his native land and into every quarter of the civilized globe. He lived to know that his untiring search for truth had resulted in one of the greatest discoveries of

the scientific world. Today he is heralded as a great benefactor of mankind.

Doctor Koch discovered the actual cause of Tuberculosis. To him it was revealed that the tubercle bacillus caused the disease called Tuberculosis. That epoch-marking announcement was made to the Academy of Medicine on March 24th, 1882, and from that event we date the beginning of our scientific study of the problem of tuberculosis.

Many scientists greeted his announcement with criticism. Many continued to hold that tuberculosis was hereditary; others that it was caused by irritation of the tissues. But Doctor Koch, firmly grounded in his scientific faith, went steadily on. So correct was he in his thinking, so accurate in his experiments and so determined in his research that we are forced to look back with profound admiration at the workings of the mind of this great man who lived years in advance of his time.

As Koch himself said when he stood before the members of the Physiological Society in Berlin to make public his discovery: "Henceforth, in our warfare against this fearful scourge of our race, we have to reckon not with a nameless something, but with a definite inmate of the body: Its conditions of existence are for the most part already known and can be further studied. Before all things, we must shut off the sources whence the infective material comes, so far as it lies in the power of man to do this."

"So far as it is within the power of man." It may seem strange, but it is true, that today—50 years after Koch first spoke the words—the most effective work against tuberculosis is that designed to "shut off the sources whence the infective material comes." It is not enough to build sanatoria for the care of those ill with the disease: for before people become ill enough to know it, they are spreading the bacillus which Koch was the first to find. It is not enough to build positive health; for it has been found that repeated massive doses of the germs can overcome strong resistance, especially when they are absorbed by children in close contact with active cases. Ever since Koch's day, organized work against the disease has been dominated by his thought. In fact, tuberculosis associations throughout the United States are even now preparing for an educational campaign, to begin April 1st and continue throughout the year, to emphasize the importance of tracing every case of the disease to its source. Often this source is in a person in the same family who is thought to have bronchitis, or indigestion, or heart trouble, or asthma. We have added the x-ray, as well as organized health departments, to our machinery for finding the disease and



developed the rest and fresh air method of treatment since Koch's announcement was made. But the basic principle of prevention is still to find the unknown case from which the known case came, to place the new case under treatment, to teach the patient to follow simple, easy rules in daily life with those about him or her, so as to avoid giving the infection to others.

Another great step in controlling tuberculosis—the tuberculin test—was made possible through Doctor Koch. When wisely used, this test helps us to find the children before damage is done and oftentimes leads us back to the source of infection.

Koch's knowledge of this great disease placed definite methods of control in our hands fifty years ago; yet, in spite of this, tuberculosis still remains our greatest single public health problem. It cost the nation \$1,071,000,000.00 last year and Kentucky paid more than her proportional part of this cost. Our death rate is next to the highest of any "regular" State in the Union. To come down to actual figures, the preliminary report from the Bureau of Vital Statistics for 1931 shows we lost 2,467 from tuberculosis last year. At the most conservative estimates, there are 15,000 cases of this disease in Kentucky today, though during the last year only 1,692 cases of tuberculosis were officially reported to the State Board of Health by all of our physicians.

Is it not time our professional men who love to follow in the footsteps of our great masters, were making determined, consistent and continuing effort to apply the knowledge that has been placed before us and so stop the ravages of the White Plague in our beloved State?

**Treatment of Lupus Erythematosus.**—From his own investigations and a review of the literature on the treatment of lupus erythematosus, Tijnenko concludes that for general treatment one should use gold preparations, arsphenamine, von Hollander's method of combined therapy, and arsenic, phosphorus, iron and bismuth preparations. To get the most favorable results one must maintain a general hygienic regimen and stimulate the functions of the vital organs and systems. Among the methods of local treatment the author enumerates cryotherapy, radiotherapy and various means that help desquamation. Roentgen therapy is not of much value and is sometimes not safe. That is why it is not recommended in the therapy of lupus. With the aid of the means of treatment enumerated, one may slowly transform any severe case to a mild one, and possibly cure the patient completely.

## SYMPOSIUM ON EMPYEMA DIFFICULTIES IN THE DIAGNOSIS OF EMPYEMA AND SURGICAL CON- SIDERATIONS\*

G. G. ALTMAN, M. D., F. A. C. S.

Louisville.

When we realize the average mortality for empyema of the thorax was 30.2% in 1918, while in some of the camps as reported to the Surgeon-General questionnaire, it ran as high as 70% to 80%, and following the work of the Empyema Commission, this mortality dropped to 10%, and in 1930 with refinements of diagnosis and improvement in time and technique of treatment and surgery to 4.3%, and in a series of more than fifty cases to 2.4%, we are made, in no uncertain way, to realize the value of giving thought to, and putting into practice, the newer knowledge had upon this subject.

The diagnosis of empyema will have to be made by the history, the physical signs and the x-ray examination. It may be confirmed by aspiration.

Of the organisms involved, the pneumococcus is most important; the streptococcus, staphylococcus and tubercle bacillus less often. It is estimated that the incidence of empyema is 2-1/2% to 5% in all cases of Lobar Pneumonia. In most all cases there is a certain amount of pluerisy. It should be remembered in all cases of lobar pneumonia, empyema may supervene. It is wise, therefore, at the earliest examination of the patient to note the exact position of the cardiac apex, in view of the possibility of its alteration later by fluid effusion.

In the greatest number of cases believed to be due to delayed restitution, the cause of the failure of the lung to return to its normal state is the presence of pus in the pleural cavity. There exists no doubt that resolution may be delayed beyond the ordinary period, however, this is more common in lobular than in lobar pneumonia.

A leukocyte count is frequently of much value. Increase of leukocytes after the tenth day, or the persistence of leukocytosis after that time, suggests pus.

The large unilateral sacculated empyema, single or multiple, is the variety oftenest encountered. It usually follows lobar pneumonia, but it may appear during the progress of the disease or almost any stage, unless caused by the rupture of an abscess of considerable size. The earlier clinical phenomena may appear insidiously, the pleural signs merging with the pulmonary, so that recognition is often late and the empyema

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

seems to have developed suddenly.

The history is at first characteristic of the lung affection, a crisis safely passed and progress toward a satisfactory convalescence. A gradual rise in temperature from a day to a week or more after the crisis is one of the early signs of impending trouble, this rise gradual at first, then sudden, reaching a peak of 104 degrees in a few days. The patient becomes more or less acutely ill but shows signs of mechanical interference with lung function rather than toxemia. Cyanosis may be present, but rarely respiratory acceleration, and when this latter does appear, it is usually due to something else besides the empyema. As the intrathoracic pressure increases the breathing becomes more rapid and if relief is not given, cyanosis, increased respiratory rate and dyspnoea develop rapidly with a further sharp rise in the already elevated temperature.

The peculiar grunty respiration of pneumonia is rarely noted and its peculiar prostration and cardiac embarrassment is not seen until the late stages.

To a limited degree the patient can move about with little dyspnoea even when there is a large purulent collection. The cough is absent or slight and unproductive. If a cough is harassing or spasmodic, it is due to a complication and often signifies bronchial irritation by pressure or that the pus is progressing toward evacuation by way of the bronchial tree and should be a warning against postponement of operation.

Physical signs in a typical case are clear but they are more striking to one who sees the patient for the first time when the process is well under way than they are to the physician who has followed the case from the beginning, and when the perspective may have become warped.

With the patient sitting or standing, viewed from behind, there is seen a distinct flattening of the affected side even when the empyema is a comparatively full one, the shoulder is depressed, the spine is scoliotic, with its convexity toward the well side, respiratory movements of the diseased side are restricted, the obliquity of the ribs is exaggerated and the intercostal spaces are narrowed.

Viewed from above, with the patient seated so that one can view in profile both upper chests, a distinct flattening of the affected side will be observed.

Vocal fremitus is increased when the exudate is very cellular.

Auscultatory signs vary with the fluid and the thickness of the pleura.

Percussion is the most important physical sign in the diagnosis. It brings out flatness over the area which directly overlies the fluid, but changes to dullness and modified

resonance when a layer of aerated lung is between the chest wall and the fluid. All signs are altered when gas or air occupies part of the pus cavity and they change with the patient's posture.

Because of the difficulty of interpretation of these physical signs, they are responsible in our experience for the vast number of mistakes in diagnosis, so that x-ray has come to be the single, dependable diagnostic factor and no operative procedure should be attempted until we have learned all we can by these means.

An exception may be made, when with a clear history, we are dealing with a case in which there is danger and distress from the tension of a chest filled with pus. With clear physical signs, dyspnoea and cyanosis, and particularly with harassing cough, a positive puncture with a large needle, should at once be followed by surgical measures for relief to tide over the emergency without insisting upon x-ray study.

In some of the cases that are considered as empyema of ordinary origin, and because of chronicity, especial effort is made for accurate diagnosis, tuberculosis is to be kept in mind. Some of these patients are physical wrecks, while the general condition of others is quite good.

When discharge has continued for a long time in spite of good drainage and irrigation treatment, tuberculosis must be considered. Sometimes Tubercle Bacilli can be demonstrated in a smear from the discharge; in other cases a guinea-pig injection may be positive; in still others one can make the diagnosis on a section of excised pleura. The patient may have tubercle bacilli in the sputum and may have been suspicious of tuberculosis before developing empyema, or he may have an old healed apical lesion.

The presence of tuberculosis does not preclude the possibility of healing. These cases are often most favorably influenced by Dakin treatment and heal. In others, radical operation alone gives a cure. The general condition of the patient is of prime importance in some and keeping the wound clean while the patient is built up is all that can be done.

The use of iodoform oil injection in these patients is recommended (Eggers), combined with sunlight treatment.

A tuberculosis empyema recognized as such, should not be operated unless secondary infection has developed.

Not many years ago, the discovery of pus or sero-pus in the plural sac placed the case in the surgical emergency class. We now believe that empyema is not a condition which calls for instant operation, unless as before said, there is disturbance of respiration and circulation with cyanosis and other grave



symptoms. Even then the emergency may be aided over by therapeutic aspiration, postponing until a time of election the operation of drainage, or radical cure, should such an operation become necessary.

The first surgical procedure to be employed is that of aspiration, preferably by the air replacement method. If sero-pus is present and relief has been given, this should be repeated as often as there are signs of tension within the thorax, with or without displacement of the mediastinum.

The treatment of empyema has three objects. (1) the removal of the pus, (2) the correction of the pathological thoracic pressure, (3) the expansion of the lung. The physician must decide whether drainage of the pus or correction of the pathological thoracic pressure is most important.

The desirability of avoiding an open pneumothorax in the removal of acute pleural effusion has long been recognized. It has resulted in the assembling of many devices as Buelans, the Potain Aspirator, Iselin Method as used by Sauerbruch and Heller (Leipzig), McEachern and K. D. Panton Apparatus and the most complicated, but most efficient, that of Deryl Hart of Duke University. All these have as their object the accomplishment of drainage without the admission of air to the pleural cavity.

After pus has formed and aspiration treatment has failed, two procedures are available, (1) closed drainage, (2) open drainage with or without rib resection.

In closed drainage a catheter is inserted with the aid of a trocar and cannula through a dependent intercostal space, usually the seventh or eighth, near the posterior axillary line, or in the case of localized empyema, at its dependent angle, a dressing is applied snugly to seal off the tract so that pleural contents will not leak externally, then the catheter is fastened to a closed circuit, so that it drains intermittently or continuously with or without the aid of suction. To aid in the evacuation of the fluid and irrigation of the pleural cavity is the desideratum of these varied apparatus. That of Deryl Hart, to which he has given the name of "Tidal Irrigation and Suction," while most complicated, is probably most efficient. Its objections are the complication of tubing, shut off, etc. and that it requires more attention by doctors and nurses than is available. Its efficiency in the face of reports is unquestioned. The course of the disease is shortened and a permanency of cure is assured.

In the main, results akin may be had by intermittent aspiration of the fluid by syringe and replacement by Dakin's Solution 0.05% at two hour intervals. At times Dakin's Solution seems to lose its bactericidal

effect, or to be responsible for intrapleural bleeding, or even cause acute arthritic symptoms, substitution of a solution of aeriflavine 1-1000 works well.

By closed drainage it is hoped that intrathoracic pressure will be maintained at a nearly negative point, so as to favor expansion of the lung and the obliteration of the pleural cavity at the same time that pus is being drained off, and chemical sterilization is being carried out. It is a question whether intrathoracic pressure stays negative longer than seven to ten days, because of the inevitable loosening of the catheter. Hart insists this can be avoided. Phemister questions whether negative pressure in the pleural cavity or even positive intra pulmonary pressure is as vital in the process of lung expansion as the pulling and contracting force of advancing healthy granulations at the parital and visceral pleural junction on the one hand, and the prevention of a thick pleura on the other. Either process is favored by open drainage.

The fundamental thing is to adapt the operation to the individual regardless of any personal preference for one method of treatment or another.

It is my belief and experience that under proper conditions, especially with reference to after care, the closed method of treatment has great advantages.

In the case of acute empyema, if a catheter is inserted through a stab incision, and pus withdrawn, without letting any air into the pleural cavity, the lung is expanded by as much as the volume of pus withdrawn. If later access of air to the pleural cavity is prevented, the lung is kept expanded. If the cavity is irrigated with an antiseptic such as Dakins it is washed not only clean, but sterilized, necrotic material, and fibres, are dissolved and carried away. From my viewpoint the result is a much cleaner surgical job than the old-fashioned rib resection. It is not the resection of the rib, but the drainage that is essential. The elimination of pus is much more thorough by the closed method, efficiently carried out, than is possible by open drainage only.

The question of open and closed drainage still persists as a debate in many minds, but the amazing drop in mortality as reported, has made us realize if the fluid is thin and translucent, no incision should be made, no matter how small.

In recent years, the principle of early open drainage in cases of acute empyema has come more and more into vogue. This tendency is probably largely due to the feeling that the acute inflammations of the pleura should be no different in principle from that estab-

lished by long practice for acute inflammation elsewhere.

It ignored the conditions shown by Graham in experimental tests on animals and by theoretical deductions, that make of an open drainage in acute empyema a positively harmful procedure which must often be in itself an immediate cause of death.

The very extensive epidemic of empyema in our military camps gave an opportunity for clinical experiment on a grand scale and it has confirmed beyond any question of doubt, the essential points of closed drainage. In the face of this evidence, it would seem that the operation of early, open drainage, of an acute empyema must be considered as bad surgery.

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### ROENTGEN DIAGNOSIS OF EMPYEMA\*

VERNON BLYTHE, M. D.

Paducah.

Empyema is an accumulation or collection of pus in the pleural cavity of the chest, compressing the lungs and displacing the other viscera. It may come suddenly but it is more often slow in forming. Empyema is frequently a complication rather than a sequela of pneumonia; it may occur as early as the third day but its recognition is nearer the ninth. Twenty per cent of the pneumonia cases in the military camps during 1917-18 were complicated with empyema. Empyema can become secondary to an old bronchiectasis. Following a general anesthesia virulent types of empyema may occur without preceding evidence of lung abscess.

Empyema is a very dangerous disease, whether its presence be determined by means of Roentgen diagnosis or clinical diagnosis, no one can ignore the causative factors at work, typhoid bacilli, tubercular bacilli, mixed germs of influenza, measles, pharyngitis, pneumonia or traumatism may be the causes at work at different times. The mortality in many of our military camps during the epidemic of 1917-1918 ran from 30 to 40% and in some instances as high as 84%. In young children up to one year of age the mortality reaches the alarming rate of 54%.

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

Later-lobar empyema is a frequent complication of pneumonia and is difficult to distinguish from these consolidations by means of the x-ray. The flat plate shadow is not nearly so useful in the interpretation as those of the stereoscopic and at times more favorable views may be obtained by the lateral roentgenograms. The tendency of empyema is to become encysted or encapsulated, the interlobar type becomes pocketed back of the sternum between the pericardium and the upper lobe which fact must be kept in mind during our roentgen diagnosis.

The majority of empyemas form much the same way following an infection of the pleura with a pleuritic effusion, being most often the results of a mixed infection. It may occur in part of the chest where the pleural surfaces come in contact. The empyema tends to become encapsulated losing its upper marginal curve which is a marked characteristic in the Roentgen shadows following simple serous effusion. Roentgen examination by clear plates or fluoroscopic observation is a great aid in localizing the point to puncture for a drainage of an encysted empyema. One of the special features to be looked for in Roentgen shadows of empyema is the dense band-like shadow enclosing the pus. When it is a frontal view the lung tissue may be seen below, whereas in simple serous effusion the fluid is to be seen in the most dependent part and the lung tissue is displaced.

The fluoroscope has a great advantage in determining the type of massive chest lesions because they can be examined from any angle. The diaphragm movement and its limitations can be observed more accurately. Heart displacement and the mobility of the mediastinal contents can be carefully estimated. You can see whether there is any pulsation in the structure under observation. Empyemas located in the vicinity of the great aorta and under the left side may appear to pulsate but this is very likely due to adhesions in the proximity of the thoracic aorta.

Differential X-ray diagnosis between the various massive shadows and the lesions of the lungs and an empyema requires considerable care, experience and observation. Yet the Roentgen diagnosis carefully made with a clear and definite knowledge of the normal appearance of the chest, with a sound understanding of the Roentgen shadows of some twelve or fourteen other pathologic conditions than empyema will indeed make an interesting and profitable study.

To fully appreciate the significance of the Roentgen shadows which make the basis for a diagnosis of an empyema we must understand the interpretation of the Roentgen



shadows of some of the leading diseases of the chest and these must be eliminated in our conclusions. A brief summary of the differences will be necessary to arrive at a true Roentgen diagnosis of empyema.

Pleural effusion, especially of the serous type will cast an almost equally dense shadow from base to apex obliterating all lung tissue detail. Its density shows a diminution from base to apex and from within to periphery and upward, there are no characteristic lines in the early stages. Later in the erect position there may be a fairly well defined fluid line shadow in the upper margin. Empyema or purulent effusion has a great tendency to become encapsulated due to the adhesions occurring between the aortal pleural surfaces and the viscera. Empyema may be partial or of the whole type, it may be total, occupying the whole pleural cavity or of the closed variety.

Lung abscess is frequently found in the central lung areas near the inter-lobar fissures, this also is a frequent site for an empyema encapsulated, it is with some difficulty that a differential diagnosis can be made by means of the X-ray. Bearing in mind that the shadow made by a lung abscess is more or less localized, somewhat rounded, less dense and surrounded by an irregular zone cast by the preceding infiltration of the earlier inflammation, while shadows cast by the empyema are more ovoid and denser, will aid the diagnosis.

Roentgenograms and fluoroscopic studies are very important in the determination of the chronic type of empyema, telling the direction, the number of the sinuses, size of the cavity in its extension or recession from time to time. Injection of opaque substances, such as bismuth paste, oil injection, solution of sodium iodide under special technic will reveal very valuable information.

Pneumo-thorax Roentgen shadows demonstrate the free air in the pleural cavity which compresses the lungs making a small well-defined outline between the wall of the chest and the lung. Where the air is present there is no evidence of an anatomic outline; if there is blood, pus or serous fluid, by changing the posture we can see the fluid level and wave fluctuation. This cannot be seen if the patient is remaining in the recumbent position of the ant-post or the post-ant direction. At times empyemas may be secondary to bronchiectasis and difficult to diagnose.

Intrathoracic tumors are other conditions of the chest which must be distinguished often by means of Roentgen diagnosis from empyemas. Most of the benign tumors and glandular enlargements are substernal. En-

larged thyroids at times project into the chest under the sternum and are somewhat smaller at the lower end. The hypertrophy may be of the bilateral variety but is most often unilateral. Cysts are single shadows rounded and well defined under the fluoroscope and the diagnosis is easily made. Lymphatic enlargements such as Hodgkins disease show multiple and well outlined shadows. Enlargements of the thymus gland, seen in the early months of childhood are found in the upper substernal region, it can be readily seen under the fluoroscope or on flat plates, but it is best seen at the end of respiration by means of the fluoroscope.

Aneurysm of the aorta can best be determined by use of the fluoroscope, during the examination the pulsation, size and direction which it points can be observed. Roentgenograms post-ant and lateral are of much value.

Malignant tumors of the chest are not infrequent. The most common primary form is the lymphosarcoma arising from the mediastinal region, it may extend into one or both sides of the thorax. The borders are clearly defined showing smooth or multinodular parts.

Primary sarcoma originates from the chest wall or from the pleura, it shows a well outlined regular dense mass, while the metastatic type may be found in large gland masses or in the miliary variety. The tumor is well defined and will often show bone destruction. The metastatic sarcoma is multiple-nodular, sharply defined and scattered over the lung field to a considerable degree.

Roentgenograms after all that may be said are only shadowgraphs or silhouettes, there are no short cuts to correct interpretations. The technician may be skilled in his art but unless he has also the experience and judgment of a Roentgenologist it does not mean that he can interpret Roentgen shadows with any degree of skill or efficiency. There are many pitfalls and errors in the way of Roentgen diagnosis, sometimes resulting in grave harm to the patients, if carelessness and ignorance are combined in the making of the diagnosis. It requires much study and repeated study of films and plates to make accurate Roentgen diagnosis of Empyema. There are many conditions of the lungs which have to be considered and excluded in the final summary. As in all lesions it is not difficult to see after it has been carefully analyzed and demonstrated but it is a different matter to recognize them in the beginning.

As Brooks and Cecil have said: "The use of the Roentgen ray is indispensable in the diagnosis of empyema, but it alone will not

keep the lazy or careless clinician out of trouble with the pathologist."

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## SURGICAL TREATMENT OF EMPYEMA\*

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Glasgow.

I will refrain from reviewing all known and unknown methods of treating Empyema.

The treatment put forth here has gradually been developed during the last twenty years, often through necessity, in cabins by a coal oil lamp. Since those dark rainy nights I have tried quite a few refinements and different methods, but time and experience have brought me back to the simplicity of my first attempt in caring for these "unfortunates," who have survived one fierce battle, enjoyed only a few days of rest, then come orders to "enter the front lines again." Handle these cases gently, they are at a low ebb.

## PRE-OPERATIVE PROCEDURE

1. Be sure you do not operate too early. Wait for nature to build up some resistance.
2. Percussion will give you dullness.
3. With the Fluoroscope locate the shadow which may fill the pleural cavity or lie walled off any where in the cavity or between the lobes. Mark on the body the outline of shadow of abscess and diaphragm.
4. With a large needle, luer syringe and ½% novocaine solution, make sure you are dealing with pus and not simple effusion. (Use Microscope in doubtful cases). It is not easily located where a small pocket is present. Do not remove needle when located, use it as a guide for incision. (a) If pure pus, drainage is imperative. (b) If straw colored fluid, withhold the knife.

## OPERATIVE PROCEDURE

1. If adult, preliminary morphine gr. 1/6.
2. Infiltrate chest wall freely with 1/2% novocaine solution, over area where pus is located.
3. Make incision between ribs about two inches in length down to pleura.
4. Control hemorrhage by touching hemostat with electrocoagulation point. Be sure you have a dry field.
5. Retract wound with mastoid retractor.
6. Open pleura, (very slight incision) insert with hemostat No. 20 or 22 mushroom

catheter (tip of mushroom cut off) until pus flows freely through catheter.

7. Do not drain too rapidly. If coughing is severe, or breathing is embarrassed, plug catheter immediately.

8. Suture catheter to skin wound with tension suture.

## POST-OPERATIVE CARE

1. Control pain with small doses of opiate.
2. If large cavity is present clamp the catheter, releasing three or four times daily until excess is drained off.
3. If pus is thick and you think there is no connection with Bronchi, fill cavity three times daily with ½% Dakin's solution.
4. Feed them more than the normal person should eat. Good nursing counts for a large per cent of recoveries.
5. Fluoroscope them weekly to ascertain if your drainage is correct, and the lung is expanding.
6. Do not remove tube until cavity is very small and drainage is slight.

Most cases of chronic empyema that have been discharging for quite a time can be cured by the simple procedure of lubricating a catheter, inserting it through the old sinus into the cavity, and filling cavity three times daily with 1% Dakin's solution. Keep this up for weeks, or until the pus drainage ceases.

## SUMMARY

1. Locate pus with needle.
2. Incise between ribs. No need to resect rib.
3. Mushroom catheter (tip removed) makes excellent drainage.
4. Dakin's solution can often be used to advantage.
5. Local anesthesia is preferable.
6. The Fluoroscope may be used to a great advantage both pre-operative and post-operative.
7. Do not remove tube too early.

## DISCUSSION

Paul A. Turner, Louisville: The last paper was a very efficient paper dealing really with the essential matters in the discussion of empyema. The first paper also was very interesting.

One point in Dr. Blythe's paper I think needs to be emphasized, and that is the difficulty in the diagnosis, particularly in reading the x-ray plate alone. It is not easy to determine the exact condition that is in the chest by looking at the x-ray film. I have in mind a case that was in the sanatorium a short time ago, a case of lung abscess. If I started to talk about lung abscess we would take very much more than the ten minutes I have, but this case we know was a lung abscess, though on the x-ray film there was a larger area of white that looked

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.



as if there was an encapsulated empyema between the middle and lower lobes of the right lung. The expert x-ray men gave a diagnosis of an encapsulated empyema, but the abscess was clearly seen, and we decided that operation was necessary. When the surgeon made the incision, he found that there was no encapsulated fluid at all. The white aspect shown in the x-ray was merely a very thick pleura and disguised an area of gangrene of the lung. I had suspected gangrene because of the nature of the bacterial analysis. We found that there was a *Fusiformis* and *Spirillum* of Vincent's, and practically always in gangrene of the lung you will find Vincent's. I don't think that was mentioned in any of the papers.

In my experience, the most severe form of empyema is one that follows abscess of gangrene of the lung. It is extremely fatal. I want to caution anyone dealing with lung abscess never to try to collapse the lung with artificial pneumothorax to obliterate a lung abscess. The result usually is fatal. In putting air in with artificial pneumothorax treatment you will block the drainage from the cavity into the bronchi, thence into the trachea, and the result is that the abscess will just balloon up and rupture in a period of two or three days, and so follows this very, very severe form of empyema that is practically hopeless.

At the Nashville meeting of the Tuberculosis Association last year I heard a man who has had a tremendous amount of experience in treating lung abscesses, say that in thousands of these cases, in doing phrenic neurectomy he had never had any bad results. With the surgeon at Hazelwood Sanatorium I have done a few phrenic neurectomies, and among those few I did one for the relief of lung abscess that terminated fatally. It was a case where the abscess was near the hilum, in the lower lobe, and raising of the diaphragm cut off the drainage and that abscess blew up. It is not a procedure that you can undertake with impunity. Phrenic neurectomy is fine in certain cases, but the abscess must be located in a place where you are particularly certain that you won't block the drainage that is already there. Just to repeat the caution, never try pneumothorax for reducing or obliterating a lung abscess, because if you do you are liable to have the most extensive, severe empyema that I know anything about.

**Ernest B. Bradley, Lexington:** I should like to discuss especially Dr. Altman's paper, *The Difficulties in the Diagnosis of Empyema*, because for one practicing medicine in a place where x-ray is not available, it is necessary to make a diagnosis of empyema without this assistance.

To diagnose empyema, there are several things to bear in mind. First, those patients with pneumonia who do not get well and where the

sweating continues, are usually considered cases of "delayed resolution,"—an old term that probably doesn't mean very much. There is only a very small proportion that really undergo delayed resolution. Most of these cases have a collection of pus somewhere in the pleural cavity.

The next point after suspecting empyema is to locate it. I think the most important physical sign of empyema, which, of course, is the same as the sign of fluid of any kind in the chest, is the dullness or flatness to the note on percussion, and secondly the absence of tactile fremitus, because on auscultation we may get the same signs as if we had a consolidation in the lung; in other words, we may have bronchial breathing, bronchophony or egophony, and yet have a collection of fluid. Absence of tactile fremitus, with dullness and displacement of the apex beat, is, to my mind, the best sign of fluid in the chest. The signs are the same whether the collection of fluid be serous or purulent.

After we have located the pus, of course x-ray is by far the most valuable diagnostic agent. We will say that we have no x-ray available. The next thing to do is to put a needle in the chest to find out what sort of fluid we have. The needle should be sufficiently large so that if pus is rather thick, it can be withdrawn through the needle.

There are quite a number of cases that we feel sure are empyemas in which we cannot locate the pus by the needle; either the needle does not reach the pus, or the pus will not go through the needle. In ordinary circumstances the first difficulty is encountered, because even with the advantage of the x-ray and careful study of the patient, it is sometimes impossible to locate a small collection of pus; at least I have found it impossible in certain cases.

One difficulty in making a diagnosis of empyema by physical signs is that in the beginning it starts the same as a pleurisy with inflammation of the pleura, sometimes this pleura is held down, adhesions form, especially at the base, and if adhesions form and the lung is held down, the signs over the chest will be obscured. The regular, ordinary, normal breath sounds may be heard, slight dullness rather than flatness may be obtained, and in putting in a needle, even though the x-ray picture shows a collection of fluid at that base, there may be two or three inches of lung still present through which you have to pass before getting into the pus.

I know personally that one of my cases came to autopsy in which every effort was made to locate a collection of pus that I felt sure was present, but because I went into lung tissue first and didn't go quite far enough, I was not able to get the collection.

In other cases, of course, the collection of pus is encapsulated. This occurs especially in

the interlobar regions where they may be mistaken for abscesses and the empyema may not be located.

Both the x-ray and the needle will fail in a certain number of cases. Some authors have recommended thoracotomy where it was felt sure the pus was present, but I have had no experience with this particular procedure for diagnosis.

Another point that I want to make is that some cases are diagnosed as chronic pulmonary tuberculosis from the character of the fever, the sweating, the cough, the sputum and so on, that are really not tuberculosis, but cases of chronic or old empyema. No case should be allowed to go as a case of chronic tuberculosis without enough examinations of the sputum to rule out the tuberculosis or to substantiate the diagnosis, because people have died with a diagnosis of pulmonary tuberculosis who had an empyema, and who, if they had been operated upon, would have had at least a chance to live.

Although the difference between the closed and open treatment of empyema was mentioned, I don't want to discuss that except to say that I believe an aspiration of thin pus should be done rather than too early an operation, giving the pleura a chance to form certain adhesions and the lung a chance to form adhesions so that the pus will not be taken out too suddenly. This is especially true where there are large collections of pus. I have seen two patients die on the operating table where a large opening was made into the pleural cavity and the pus let out too quickly. If aspiration is done for a few days or is done a few times before the final surgical operation is done, more patients will get well.

**Donnan B. Harding**, Lexington: The roentgen diagnosis of empyema may be a very simple problem, or it may be so complex that the radiologist alone cannot reach definite conclusions. The simple unencapsulated effusion, showing a dense area in the base of the chest, obliterating the diaphragm shadow and displacing the heart toward the opposite side, is of course easily recognized. The encapsulated lesion is not always so readily determined, especially when it is located in the upper part of the chest or in the interlobar fissures. Then all those lesions which can produce localized areas of intrathoracic density must be considered in reaching a diagnosis. Dr. Blythe has discussed this problem in detail. But I think he should have emphasized more fully the value of lateral views of the chest. When there is any question of empyema, the lateral view should be a routine procedure. This brings up another point. The referring physician should give his radiologist some information before the x-ray examination is done, so that special work such as lateral views can be included in the examination when indicated.

Also, a consultation between the radiologist and the internist may permit a definite diagnosis, when the x-ray findings suggest any one of several types of pathology. An encapsulated empyema along the mediastinal shadow may resemble a neoplasm. But if the referring physician can add a history of pneumonia, with persistent fever and a leucocytosis, the diagnostic problem is simplified immediately.

The third and most difficult type of case is the empyema with multilocular pockets. The various pleural lesions may overlap, or be overshadowed by pulmonary consolidation, so that both the anteroposterior and lateral films are bewildering. Here an exploratory aspirating needle, guided by both the physical examination and the x-ray findings, may be necessary.

**Wallace Frank**, Louisville: The medical aspect and the diagnostic side of the study of empyema have been very well brought out, and I would speak but to the surgical treatment.

In the first place, operation on an empyema is not an emergency operation. Many cases are operated too early. It is just as impossible to drain the entire pleural cavity as it is to drain the abdomen. If you allow these patients to wait until the pus is localized, the treatment surgically becomes a relatively simple problem.

Localization of the pus by the needle is a most important thing, as has been brought out, but aspiration with the syringe has added importance which I think is of even greater value, and that is the study of the type of bacteria that is the offending agent, and also the character of the fluid evacuated.

In cases where the fluid removed is thin, we believe that aspiration is the method of choice as to treatment, that that case should not be treated by the institution of open drainage. Furthermore, if in a study of the fluid bacteriologically by smears and cultures, no bacteria are demonstrated, the great probability is that we are dealing with a tuberculous empyema in which, to my mind, open drainage is absolutely contraindicated.

When the fluid is thick, open drainage must be instituted, at least drainage whether by open or closed method must be instituted. We have used the open method with exceedingly good results. The important thing is to put your drainage in a dependent position. I don't believe that irrigation of the cavity is at all necessary or essential. If your drainage is in a dependent point, the pus will come out, the growth of granulations tends to pull the lung out, and with proper lung exercises instituted early the cavity will be obliterated. The greatest troubles that we see, I think, arise from a too early removal of the drainage tube, with the subsequent closing off of the tract and the re-accumulation of fluid.

I think that lung exercises following drainage



of an empyema especially blowing against resistance, are very important, otherwise the lung does not approach the chest wall and the only way the cavity can be obliterated is by the two pleural surfaces coming together. When this does not occur a chronic empyema results, the treatment of which is not only attended with some mortality, but the results of which may not be so good. There is only one way to treat a chronic empyema, namely, freeing the lung and bringing it up to the chest wall, or taking the chest wall down to the lung, both of which are major surgery procedures.

**Oscar O. Miller**, Waverly Hill Sanatorium: I have enjoyed Dr. Altman's and Dr. Blythe's papers, and I wish to commend to you Dr. Blythe's concluding statement, "that the x-ray will not keep the careless clinician out of trouble."

The diagnosis of empyema is difficult because it is secondary to another pre-existing disease; the onset is rather insidious and unsuspected, and because of this the clinician is likely to overlook it. As has already been pointed out, a secondary rise in temperature following the crisis is indicative of a collection of pus and not of a delayed resolution.

In pneumococcus empyema, the empyema forms late, and 50 to 60 per cent of these empyemas are due to the pneumococcus. In the 25 per cent of cases which are due to streptococcus, the empyema is preceded by a bronchial pneumonia, and the formation of the fluid takes place early.

I was glad that Dr. Bradley brought out the two significant features in regard to the diagnosis of this condition: a flat note and the absence of tactile fremitus. Bronchophony and egophony and bronchial breathing may exist in the presence of fluid when the underlying lung is consolidated, because under these conditions you have a good medium for the conduction of sound. Another significant feature is tenderness on pressure due to the inflammatory reaction in the pleura. In neglected cases there is some edema of the chest wall with obliteration of the intercostal spaces, and a glossy appearance of the overlying skin. This not infrequently is the forerunner of empyema necessitatis.

Shifting of the viscera to the opposite side is a very important sign and is greater with an effusion of pus than with serous effusion. These patients are toxic; they look sick due to a secondary anemia which takes place early and is rather characteristic. This secondary anemia is almost diagnostic in neglected empyemas, especially in children. Associated with the pallor, are parrot-beak nails, or clubbing of the fingers. This clubbing may take place early, sometimes inside of three or four days.

I feel that the physical signs in empyema can still be depended upon, and that they are

sufficiently distinctive for a diagnosis.

The next logical procedure when one suspects an empyema is thoracentesis. One of the common faults in aspiration of the pleural cavity is to insert the needle at the most dependent portion of the lung. In this location the needle is apt to become clogged with fibrin or the diaphragm is pulled up and the costophrenic sinus is obliterated which results in a dry tap. The point at which to aspirate for a diagnostic puncture is the center of the flat note, and under these circumstances more often will you find fluid. The one who makes a diagnostic puncture and gets fluid every time is the one who punctures too infrequently. When one suspects fluid he ought to make a diagnostic puncture, and one expects under these circumstances to get a moderate number of dry taps.

It is questionable as to whether the tubercle bacillus can produce an empyema of itself. Some have thought that these cases must be complicated with secondary organisms. This is not necessarily true. With the presence of the tubercle bacillus, often the fluid is more or less serous, turbid, and later on becomes distinctly purulent.

One of the advantages of this diagnostic puncture is that we are able to determine the character of the fluid. That thick, creamy pus which is so characteristic of a pneumococcus, which separates out into two layers with a thin, watery, greenish layer above needs no description. The culture in these cases is not very satisfactory because the pneumococcus dies out early, but the direct smear can give a good deal of information.

Whenever one gets a sterile pus, he ought immediately consider that he is dealing with a tuberculous empyema. A tuberculous empyema begins insidiously, the patient is not acutely ill, and does not look ill.

The treatment of a tuberculous empyema is repeated aspiration with as small a needle as is consistent for the purpose; irrigation with one to five thousand solution of acriflavine, and if this does not control the lesion, an oleothorax is indicated.

**Walter I. Hume**, Louisville: I regret that Dr. Howard is not here to read his paper on the Surgical Treatment of Empyema this morning. However, the question of surgical treatment has come up, and I want to address a few remarks to a special class of empyema cases which I think deserve special treatment, namely, those cases under two years of age, in which the mortality has been rated as high as 50 to 70 per cent.

I was very glad to see the drift here to the closed treatment in these cases. Sauerbruch in a splendid article abstracted at length in S. G. and O. about eight months ago advocated the closed method as the only way to reduce our mortality in children under two years of age,

particularly since they have nearly always a large collection of thin, fluid pus, and particularly since the respiratory efforts are so weak under stress, perhaps of having had a preceding pneumonia. Such conditions will allow the lung to retract, and you get adhesions of the lung toward the hilum instead of allowing approximation to the chest wall which approximation you must have to finally get a good result.

In a visit with Hedblom, I learned he was using the closed treatment particularly in these little, weak fellows, and he declared that he had nurses specially trained to see that the method stayed a closed method. With a trocar between the ribs at the most dependent part, a tube is properly placed and neatly sealed in. You clamp the catheter or tube off, and with an aspirating syringe in place lift your clamp and aspirate what amount of material you want. If you irrigate, as some have suggested here, with Dakin's or some other antiseptic solution, all right, but see that the opening and the closing maintains the closed drainage idea, otherwise some careless attendant will come along and allow the atmospheric pressure to collapse the little lung if it is still uncollapsed, and your closed drainage is ruined, for the time being at any rate. He has a special team for looking after empyema cases, particularly in the winter time when they are so prevalent.

I have had an unusual experience with these little children, and we have lost so many of them that I think the treatment of them demands special care and attention. It is quite usual, I know, and I have had calls to come and do a rib resection when we have an empyema. Whether I am going to do a rib resection depends on what we find when we get there. If we have localized pockets of pus, all right; if we have a total empyema with thin pus, no, we will aspirate and we will use a trocar cannula drainage, a closed drainage, as strictly as we can make it so, even if finally we have to go back and resect a rib or ribs and break up a few pockets with the finger. I think even a two-stage program for these little children is a much safer procedure and our mortality will be cut down by doing that.

**John W. Scott, Lexington:** I should like to call attention to two definite diagnostic criteria, one in differentiating empyema from chronic pulmonary tuberculosis, and the other in differentiating it from lung abscess.

In the first place, as Dr. Bradley in his discussion pointed out, it is not unusual to find patients with long-standing empyema which has ruptured into a bronchus, who have been set aside as chronic pulmonary tuberculosis, far advanced, in a hopeless state. It is a fact that nobody, I think, will attempt to controvert, that a purulent sputum which is persistently negative for tubercle bacilli is never due to pulmonary tuberculosis. This is a diagnostic cri-

terion that I think will positively differentiate these cases from chronic pulmonary tuberculosis.

The other definite diagnostic criterion is the character of the sputum in the diagnosis of sacculated empyema, which has ruptured into the bronchus, from lung abscess. The sputum of lung abscess has long been clearly defined. On standing it separates into three layers, the lowest containing lung detritus, the second a more or less turbid fluid, the third a foamy layer. The fetid odor of this and of the breath in lung abscess is itself so characteristic as almost to make the diagnosis. Pus from empyema may be abundant and may have an offensive odor but it never separates into layers and it has not the odor characteristic of abscess.

It has been said that the aspirating needle should be large enough; at the same time it should not be too large. It is surprising how small a needle will aspirate thick pus with the great negative pressure that is developed in a Luer syringe. I myself have aspirated creamy pus with a needle of 21 gauge, which is not much larger than the ordinary so-called "blood" needle. If one uses a needle which is large enough and yet not too large, he may explore more widely than if he were using these very large needles. Most of the failures to get pus are due to not getting the point of the needle into the pus. I think it is rarely due to the fact that the needle is too small.

I commend to you gentlemen of an investigating turn of mind that you take some thick, creamy pus and see through how small a needle you can pull it up into a syringe. Some of you will be surprised.

**G. G. Altman, (In closing):** I am very grateful for the very liberal discussion. It has been so liberal and complete that there is nothing for me to add. Whatever I would try to add would be superfluous. I might comment on one or two things that occurred to me as being of importance to bear in mind, especially with reference to what Dr. Wallace Frank has said, the question of drainage of the dependent points. We must not overlook the fact that drainage of the dependent points in the face of an empyema may be drainage at too dependent a point after drainage has occurred. After drainage, the diaphragm will rise, and we often have osteomyelitis of the rib, definitely due to pressure, as well as shutting off of the catheter and non-drainage due to placing the drainage entirely too low.

In the matter of rib resection, we must not overlook, of course, the use of bone wax.

I had hoped in the very brief remarks I made on surgical considerations that someone would bring up the progress of the last few years in the question of artificial drainage by inspiration and expiration as perfected by Dr. Deryl-Hart and others, notably Hart, as shortening



the convalescence and giving us what we don't often get otherwise, a permanency of result. In spite of the fact that it looks complicated, it is more or less simple to handle and does not require the team such Sauerbruch uses. It is a very simple thing and works out without a great amount of effort, and it certainly is most efficient. I commend it to your consideration. One can make the apparatus with a few bottles, a few pieces of tube, a stopcock, and a connection, and it is not much more complicated than Dr. Hendon's famous apparatus, and any who have used that know what a great god send it is in many, many things.

**Vernon Blythe**, (In closing): I have been very much interested in the illuminating discussion of these papers, and I appreciate it very much. In fact, I often read the discussion of these papers in our Journal before I ever read the papers; that is how much I think of the discussions. They bring out and epitomize the points that are most interesting in the paper and the things that we should think most about.

Concerning some special features of the paper, I think we should give more x-ray interpretation to chronic empyema, especially because it keeps us in touch with the ramifications of this, and in many ways helps us to limit it and give a treatment that will be more effective.

I appreciate especially Dr. Harding's comment upon the co-operation of the roentgenologist with the clinician. When these cases are referred the internist should send them with all the history and information that he can get. Just simply to send the patient to an office where there is an x-ray machine and to tell the roentgenologist to take an x-ray plate of the chest doesn't mean a great deal. True, the roentgenologist ought to interpret that plate to the fullest limit and the best ability he has, and he usually will, but if you have some reason to suspect an empyema, you concentrate his vision, you concentrate his efforts upon it, and many times he will unravel a problem that possibly he would overlook unless he had that information and clinical history and diagnosis.

The treatment is a very interesting phase of this. There is one thing that I think is helpful in the treatment of empyema, especially those empyemas that are not very active and extensive. I think we should give more consideration (and I am sure the time is coming when we are going to think more and more of it) to the use of the ultra-violet rays and even the x-rays in the therapy end of the treatment of empyema. I am positive that I have seen some splendid results from mild fractional dosage in abscesses of the lung, extensive abscesses, and also very small fractional doses in the treatment of children who have the sluggish chronic condition of an empyema.

## ETIOLOGY IN THE DIAGNOSIS OF HEART DISEASE\*

O. P. NUCKOLS, M. D.

Pineville.

When notified by your Program Committee that I was to write upon this topic, I was greatly impressed with the importance of the subject, and I was also greatly depressed by the fact of my inability to do it justice.

If we were starting upon a long journey, it would be quite natural to want to be perfectly assured that we were upon the right road in order that we might enjoy the pleasant anticipation of arriving at our desired destination. This same thought is quite pertinent in undertaking the study of the presumptive cardiopath.

Etiology, including a careful history, is the proper starting point and no diagnosis is quite complete without a clear concept of all the etiologic factors. It is perfectly clear to my mind that if we begin at the beginning and get a well grounded conception of the etiology it will add much to a clear-cut diagnosis as well as a more accurate prognosis.

In arriving at an etiological diagnosis we must make use of heredity, family history, past and present personal history, age of patient, structural lesions, and functional disturbance.

It may be just as well to say in the beginning that we occasionally meet with cases in which there are well marked structural lesions and functional disturbances in which no definite etiology can be determined. Such cases have to be classified as of unknown etiology. It might be said in this connection, however, that it is more than probable that many such cases are of rheumatic origin in which the heart is the only participant. It does not take any very great stretch of the imagination to believe that an insignificant sore throat may have released a small army of streptococcus rheumaticus which lighted up as endocarditis without other manifest lesions.

Etiologically diseases of the heart may be grouped about as follows:

1. Bacterial, including the rheumatic type.
2. Toxic, including focal infections, mineral poisons, tobacco, coffee, etc.
3. Syphilis.
4. Arteriosclerotic and hypertensive cases.
5. Thyroid, functional and neurotic cases.

In the first group will be found most all the more acute inflammatory cases of the young. Rheumatism is now regarded as a

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

streptococci infection and responsible for a much larger per cent of heart cases in the young than any other one cause. The streptococcus rheumaticus seems to have a special predilection for attacking the heart in children.

The question might be asked, Why this special danger to childhood? Rosenau states that in his experimental work he finds that the blood vessels supplying the endocardial membrane are relatively larger in the child than in the older ages, also that the vessels supplying the valve leaflets are terminal ones and have been found literally packed with bacteria when present in the blood stream. He further states that because the phagocytes cannot enter and do battle they are more destructive. It seems a peculiar fact that rheumatism in the young attacks much more frequently the endocardium and in the older ages the myocardium. The source of infection in the young, is usually the throat and especially the tonsils. What seems to be a mild tonsillitis is often followed by joint pains, slight fever and an endocarditis, pericarditis, and occasionally a pancreatitis. If the infection be very severe the heart muscle may be involved, which adds to the gravity of the case by weakness and dilatation of the heart wall. This is more often a typical history in the child, but in older patients with more chronic or subacute infections, the heart may not show evidence of disease for several months after the rheumatic attack. If the infecting organism happens to be the streptococcus pyogenes, as in tonsillar abscess, then the endocarditis would be of the septic type with severe and pronounced blood poisoning, practically always fatal. Fortunately, this is very rare, however, this form of infection is not confined to the throat, but may arise from other sources of focal infection of the pyogenic variety.

So far we have mentioned only rheumatic infection of children as an etiologic factor in diseases of the heart. However, practically all the bacterial diseases play an important role whether it be diphtheria, scarlet fever, pneumonia, influenza or a pyorrhea alveolaris.

A toxic etiology would include mineral poisons, tobacco, alcohol, coffee, focal infections and possibly the fatigue poison from over-work.

Syphilis is the Shylock who exacts its full pound from the heart and blood vessels. It is not quite so bold in its depredations but silently and insidiously fastens its tentacles upon the heart and especially the *father of waters*, the aorta. Within the coats of the major blood vessels inflammatory changes take place which may eventually result in that incurable dilatation known as Aneurism.

It may be an aortitis near the valvular ring causing incompetency of the valves or there may be distortion with contraction resulting in stenosis. The coronary arteries may become sclerosed and narrowed, producing an anoxemia of the heart muscle with degeneration. Some of the best authorities attribute the terrible anguishing pains of angina pectoris to an aortitis—the degenerate child of a long forgotten social laxity.

In the fourth group are the hypertensive and arteriosclerotic cases. Hypertension may be met with occasionally in the younger ages, as well as the old. It may and often is a prominent symptom in arteriosclerosis; however, permanent hyperpiesia may exist without definite known cause for many years before organic changes become evident.

True arteriosclerotic heart disease is usually in patients from the fifth to seventh decades of life, and often without high blood pressure. This is to be accounted for by the fact that the coronary arteries participate in the sclerosis producing myocardial degeneration. The true etiology of arteriosclerosis is a mooted question—we know much more of the result than the cause. Warfield says that hypertension often leads to the production of arteriosclerosis. Prof. Clifford Allbutt of London, divides the causes of arteriosclerosis into three classes: Toxic, the result of extrinsic poisons and those of infections. Hyperpieitic—arteriosclerosis developing as a result of long continued elevated blood pressure, a notable example of which is that of granular kidney in which there is no clinical evidence. Third, the involutionary class, or that which depends on senility. This may be just the expression of wear and tear and if I might hazard an opinion, largely due to a break in normal cell metabolism.

Both hyperthyroidism and hypothyroidism are etiologic factors in diseases of the heart and should be fully set out in the diagnosis.

The purely functional and neurotic cases depend for diagnosis on a rather wide variety of causes, such as anemia, nervous reflex, mental states, fear, anxiety, worry, etc.

It is not the purpose of this paper to discuss at length any particular group of heart cases, but rather to urge a more definite system of nomenclature with an etiologic foundation.

The older order of things was to become verbose about a mitral regurgitation as a disease entity and as a complete diagnosis. The new order of things consists in arranging the criteria in a way that gives a complete mental picture of the case.

This is necessary for the study of diseases of the heart and circulatory system that physicians working in different sections of the country may know that they are using



the same terms applying to the same conditions, besides such a comprehensive diagnosis is essential to a well grounded prognosis and effective treatment.

The American Heart Association has adopted a system which is being used by most of the leading cardiologists. Its essential feature in classification is to set forth the etiologic factors, the structural changes, the physiological deviations and the functional capacity. Under this system, a case of mitral disease would be classified as follows:

A. History, rheumatism, chorea, inactive  
B—Mitral regurgitation, auricular fibrillation, C—Arrhythmia, D—Functional capacity class b—activity greatly limited.

This presents a case with rheumatic history of the chorea form. It states that the structural lesion is of the mitral valve with regurgitation, also that it is an advanced case with auricular fibrillation and further that the functional capacity is greatly impaired, patient possibly bedfast or limited to very slight activity. This method should be followed in the study and diagnosis of all cases of diseases of the circulatory system.

There are three principal etiologic factors in heart disease, namely, rheumatism, syphilis, and arteriosclerosis, which are relatively easy to elicit by careful examination and upon which to found an etiologic diagnosis, but there are many other cases met with not so easy to classify.

Hyperpiesia has attracted much attention in the last few years and from my observation is the initial symptom in many myocardial degenerative cases met with in the middle period of life; however, the cause or causes of hyperpiesia are not definitely known. It may exist for an indefinite time before organic change can be detected.

Too much food, intestinal stasis, deficient combustion, defective elimination, long continued infections and an incredible list of hygienic indiscretions add to the mirrored maze of etiologic possibilities. So, in using hyperpiesia as an etiologic factor it should be followed by a question mark. In the study of etiology in heart diagnosis we should not overlook the subject of heredity. It is a true saying that we are as old as our blood vessels and the quality and strength of our blood vessels runs through families; otherwise, how can we account for cerebral hemorrhage as a family trait?

Family history, personal history, past and present, some times furnishes the key which unlocks the door to the case in hand, and gives us a clue to an etiological diagnosis.

I am fully aware that this is but a sketch of this important subject, and I might continue to burden you with statistics and case reports which to my mind would serve no

very useful purpose, for he who looks will find, and time and your patience must have their limits.

#### PREVENTION

I should feel derelict in duty if I did not say something in conclusion upon the subject of prevention of heart disease. It is with the subject of etiology that prevention is most concerned.

Since the cause of tuberculosis was discovered by Koch, the death rate has been lowered by prevention more than by treatment.

From the present data available it is estimated that over 2% of the population of the United States are victims of organic heart disease, over 2,000,000 persons. The death rate from organic heart disease has been increasing through a series of years, and if present conditions continue, it is estimated that one child of every five of the population living at age ten years will die of heart disease.

The chief cause of heart disease in early life is rheumatism. While the cause of rheumatism may be in some doubt, we are quite certain that we are dealing with a germ disease. There is some evidence supporting the belief that rheumatic infection enters by way of the tonsils, adenoids, or decayed teeth. Rheumatism, chorea, growing pains, and tonsilitis, should be looked upon as danger signals for the heart and should receive early and appropriate treatment. Children who have had one attack of rheumatism are liable to recurrent attacks. Undernourishment lowers vital resistance to infections and indirectly endangers the heart.

In the older ages, syphilis, arteriosclerosis and high blood pressure stand out as principal causes of heart disease. People who live sedentary lives, whose work is chiefly mental and who get but little exercise and outdoor life, who eat too much and sleep too little are potential cardiopaths. The already damaged heart may, by limitation of the patient's activities, and if patient is made to pursue a suitable mode of life, the lesion may become stationary and life much prolonged. Active measure should be taken toward the prevention of all these conditions which endanger the heart. The whole subject of the prevention of heart disease has to do with etiology and the more we learn of the cause or causes, the better prepared we are for prevention.

It is a large problem and should enlist the fullest co-operation of the Medical Profession. Periodic health examination should be urged, the examination of school children by competent examiners should become universal.

In the examination of large groups the

work cannot be so careful and complete as in private work, but sufficiently so, that those showing any signs of heart trouble can be asked for a private examination. In the examination of large groups, we have to depend upon the general appearance of the child, the heart rate and the heart sound, principally, for our decisions as to whether we ask for further examination.

Modern cardiologists have almost tabooed heart murmurs which I consider a mistake, for a perfectly healthy person does not complain, and neither does a perfectly sound heart murmur, except a few functional cases, and while we should not set too great stress upon murmurs alone, or make them a fetish upon which to base a diagnosis, however, upon the other hand, they may mean—

"The rift within the lute  
Which soon shall make the music mute."

#### DISCUSSION

**Virgil Simpson, Louisville:** This is an exceedingly interesting subject to all of us individually, as well as collectively, since we all have hearts and since we are striving to live as long as we may. We are more and more likely, the older we get, to have some form of cardiac disease.

One of the things of importance in connection with a grouping of causes of heart disease is trying to make some proper and perhaps rather fine discrimination between causes which might, in the book, be classed together as toxic. It is true that there are certain differences found in a diphtheritic heart, for example, and a thyroid heart, so-called, and yet in the last analysis it seems to me that they bear much in common, and perhaps for the purposes of the profession at large the term "toxic causes" might be made to include such. Yet, there are certain hallmarks which appear to set aside the so-called thyroid heart as a separate group. For example, I know of no condition in which there appears to be as much damage done to a heart as occurs in a toxic thyroid state, and from which as large a per cent of apparently satisfactory recoveries take place. Judged from a functional standpoint alone, in a thyrotoxicosis, whether it be exophthalmic goiter or a toxic adenoma or a mixed variety, it is not at all uncommon, in fact it is rather a common finding to observe auricular fibrillation. To the casual observer auricular fibrillation is a rather formidable condition of affairs. A heart that is rapid and a heart that is totally irregular and that persists as such spells disaster to most of us, perhaps, until intensive study and observation is given to the subject. Yet I see improvement in no group of heart conditions that present clinically as formidable a picture as this comparable to the results of proper care of thyrotoxicosis. These rapid, irregular hearts,

will return very, very frequently to a perfectly normal rhythm in the course of a few months following a satisfactory surgical procedure.

I would counsel those of you who are at all interested in hearts and who have to make some sort of a diagnosis in your vital statistics returns, to secure a copy of the little manual approved by the American Heart Association, in which a suggested nomenclature is set down in comparatively simple terms. As Dr. Harvey and Dr. Nuckols have said, it is important that we have some common ground of classification.

One of the difficulties that confronts us with regard to the study of hearts is the determination of the function that a given heart now possesses. It is interesting, of course, to know whether it is a rheumatic heart, a thyroid heart, a diphtheritic heart, a scarlet fever heart, or an arteriosclerotic heart, but after all, it is of tremendous interest to the patient as well as a great comfort to the doctor to be able to speak in measurable terms of what this individual patient can do.

It recalls a very interesting or amusing thing that occurred to one of our Louisville physicians a year or two ago. He had a patient on the table and was examining his "fundament" as he called it. Two or three visiting doctors were present in the office, and he became very much interested in discussing a rather unusual condition with the visiting doctors. The patient tired of so much discussion, and he said, "But Doctor, when am I going to get well?" The sequel of the story is amusing but has no connection. He was told in a very friendly sort of fashion, "Get well! Why, I will treat you for five years and then you won't be well."

The application here is the question in the patient's mind: How much can I accomplish, how much actual work can I do and still not bring too great a strain on my heart? You as doctors must try to evaluate the ability of the heart to carry on whatever its causative relationship. You must try to help the individual determine how much his heart can do, and unfortunately we have no commonly accepted means of determining heart function.

I think that it doesn't matter so much, perhaps, just what kind of heart function test one may elect to use, whether one or another or a combination of several, but I do believe that it is important that whatever test is selected to help decide how much function a heart still possesses, that one use that same plan all the time. In other words, use the same yardstick. You become familiar with your method, your study, and you can be more nearly accurate in your evaluation of your findings if you use the same procedure; whether it be as good as somebody else's or not is scarcely the point at issue, but use your test in your effort to determine something of how much your patient's heart can do. It is a serious thing to take a business



man and immobilize him, take him out of his office, away from his business, because he has this or that or the other heart disease. The term "heart disease" strikes terror to the average patient, whether layman or doctor. I have never seen anybody any more concerned about their health than doctors who have found that they have some cardiac disease.

**Emmet F. Horine**, Louisville: It is important to emphasize the necessity for an etiological diagnosis in heart work. Formerly we were merely taught to make a structural diagnosis, for example, mitral insufficiency or aortic stenosis or aortic insufficiency depending on the murmur heard and without more ado to begin treatment. The patient was ordinarily instructed to take life easily and digitalis was usually given. We now recognize that this constituted a wholly superficial and inadequate procedure.

Primarily we are more concerned with an etiological diagnosis than a structural one. In fact our present treatment is based more upon the etiology and upon the functional condition of the heart than it is upon the structural diagnosis. For example, a patient is found to have a blowing diastolic murmur at the second right intercostal space or mid-sternally. This diastolic murmur evidences an aortic insufficiency. With this structural defect in mind we make a full and careful study of the patient to determine whether the etiology is rheumatic, syphilitic, arteriosclerotic or from some other cause. You can readily understand how important it is to determine whether the involvement is syphilitic in type because of therapeutic considerations. No cardiac diagnosis is complete without a determination of the etiology.

**O. P. Nuckols**, (In closing): I do not want to enter into any discussion but want to thank the gentlemen who have discussed my paper for the very generous manner in which they have done so.

When notified by the committee that I would only be allowed fifteen minutes time you can fully realize how hard it was to condense a few of the more essential facts upon this very important subject, and was then compelled to delete a part of the reading.

The section covering arteriosclerosis I did not have time to present to you. I want especially to thank Dr. Horine and also to concur with Dr. Simpson in his discussion of the importance of determining the functional capacity or cardiac index as it is sometimes referred to. The ability of the heart to function and just how much the patient can do.

## CERTAIN PROBLEMS IN THE TREATMENT OF FRACTURES\*

M. D. FLANARY, M. D.

Pikeville Clinic, Pikeville.

The first two important requisites in the treatment of fractures are that: (1), the surgeon should have an accurate mental picture of the condition with which he has to deal and that (2), he should have a clear understanding of the pathological processes associated with a fracture. Diagnosis and knowledge of pathology are the foundation of successful treatment and a mechanical sense is a prerequisite of the next great importance.

In the treatment of fracture the surgeon should bear in mind that he is dealing with a wound, a lacerated wound of bone, which in its pathology and treatment is amenable to the same laws that govern wound in other tissues. A fracture is associated with rupture and injury of blood and lymphatic channels, not only in the bone itself but also in the periosteum and surrounding tissues.

In the case of fracture of long bones this injury to the vessels and soft tissues is very considerable. Blood and lymph escape from the torn vessels and exudation of serum and leukocytes takes place through their walls. This exudation occurs from vessels (1) which have been directly injured by the fracture force; (2) which have been irritated by fragments of bone; (3) which have been injured by stretching or distortion. This exudate undergoes the changes of wound exudate. The fluid is absorbed, and the new wound connective-tissue cells become converted into spindle cells, which form a network with the fibrin and finally goes on to formation of callus.

In simple fractures the asepsis of the wound is already secured. We therefore have to look to the next important step in wound treatment, coaptation—immobilization and protection.

The immediate treatment of fractures is based upon two fundamental principles—the correction of the deformity and the holding of the fragments in normal apposition until they unite. The methods of replacing the fragments in their natural position varies much with the character and location of the fracture. In many fractures there are no displacements of fragments, while in others it may be great. Simple fractures without displacement are sometimes changed into fractures with displacement or into compound fractures by movements of the limb immediately after the accident. It is very common for a simple fracture to be rendered

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

compound by penetration of the skin by a sharp point of bone. It is therefore important that care be exercised to prevent these injuries from being made worse.

There are a few questions that the surgeon should ask himself when he is called to treat fractures:

(1) Is the patient in shock? If so, the treatment of shock should coincide with preliminary immobilization of the patient.

(2) Is there any nerve lesion? A nerve may be torn, caught between bony fragments, or otherwise injured by the fracture. A neurological examination of the involved part should always be included as part of the routine examination. This is often the case in fractures of arm and forearm.

(3) Have any important blood vessels been injured? It sometimes happens that the brachial artery is crushed in fractures of the humerus. Of course we would have to maintain proper body temperature in the limb until collateral circulation became manifest, before we could align and immobilize the fracture.

(4) Is there any injured organ? Fractured ribs may puncture pleura and lung, causing surgical emphysema. A fractured pelvis often ruptures the bladder or the urethra and often tears the mesocolon. A fractured clavicle may do great damage to the subclavian vessels or brachial plexus. Of course these problems must be treated before we proceed with permanent alignment and immobilization.

In correction of the deformity or the setting of the fracture the correcting force should be applied gently, firmly, and gradually, increasing until the desired result is secured, not quickly and abruptly. When there is a simple lateral displacement the limb should be grasped firmly by one hand above and by the other hand below the fracture and as steadily increasing traction is applied the lower fragment should be slipped into place. When the muscular resistance to correction is still greater, an assistant may make counter extension above and steady the leg while the surgeon with both hands applies traction and correcting manipulations.

In correcting angular displacements, whether the fracture be complete or of the green stick variety, extension should be employed at the same time as the lateral force, which overcomes the angulation. The deformity of an impacted fracture is overcome by direct traction to draw apart the fragments.

Time and pains in making satisfactory diagnosis are well spent. It is always the part of wisdom to have an assistant. This is especially true in setting fractures of the lower extremities.

General anesthesia is a great aid in diagnosis as well as in the reduction of the deformity. Of course judgment must be used in determining the advisability of its employment.

Ordinarily the reduction of a fracture is simple and satisfactory but there are certain obstacles to reduction which may intervene. Muscular contraction is the most common problem that the surgeon has to deal with. Another great obstacle is pain. A general anesthetic overcomes both of these. The old method of tiring out the contracted muscles by making continuous extension against them can not be recommended. Immediate and complete reduction is the thing.

Another great obstacle to reduction which is often mistaken for muscular resistance is the interposition between the bone fragments of muscle, clot, periosteal tissue, fascia, or loose fragments of bone. When a satisfactory reaction can not be effected because of these things, then we must expose the fracture and remove the hindrance to reduction.

One thing we should strongly emphasize: the reduction and immobilization of fractures should be attempted as soon as possible after the accident.

Holding the fragments in normal position is accomplished by splints, by bandaging, by extension or by direct fixation. In certain cases the fracture remains in correct position without the use of any of these artificial means. After the fragments have been in position and a permanent splint applied there should be little or no pain. If the pain is persistent the surgeon should know that there is something wrong and the cause of the pain should be sought. An uncomfortable splint should not be left on. There is on the market today a splint for any fracture. While some of them are simple, others are complicated and take a good first-class mechanic to operate them. Still we have the old plaster Paris bandage and boards.

Operative treatment and direct fixation of fragments are indicated when, despite the best efforts, the fragments cannot be brought into satisfactory apposition. Operation should not be done until the surgeon has made use of all the possibilities of non-operative treatment. The surgeon should not rush into the operation too fast. He should ask himself, "Has everything been done?" An exact anatomic result need not be expected in all fractures. The x-ray should guide but not misguide. If there is apparent good position, and function is restored, the treatment may be regarded as successful, even though the x-ray shows that the position of the fragments is not accurately restored. No rules can be laid down. The surgeon must use his best judgment.



When all other resources have failed, the surgeon is justified in exposing the fracture and applying such local treatment as the condition requires. The best time for such operation is from the fifth to tenth day after the accident, when traumatic reaction has subsided. In bones near the surface, such as the patella, operation may be done on the second or third day. Of course fractures with pressure, as visceral injuries, require immediate operation. When the surgeon feels that neither splints nor extension will hold the fragments in place he should proceed to the direct fixation of the bone ends.

The after care is very important in the treatment of fractures. The limb should be fluoroscoped often and measured. Massage of muscles and joints and movement of proximal and distal joints, first passive and later active, should be employed as early as possible. Pneumonia and bed sores should be prevented and early use should be made of ambulatory splints in selected cases. The test of weight bearing or of free muscular action should be attempted only after the x-ray has revealed a fair degree of density in the permanent callus.

#### DISCUSSION

**Charles C. Garr, Lexington:** I have enjoyed Dr. Flanary's paper. He has given us a broad general outline as to the proper method to treat fractures. He has been conservative and has laid down his rules upon conservative lines. It is difficult, however, to discuss a paper on fractures. It is such a broad field, it is somewhat like discussing disease. They are so many and so varied and the treatment varies so much that one is inclined more to drift to certain specific fractures than to talk about fractures as a whole.

However, closed reduction should always be attempted. Shock, as the Doctor has pointed out, should be treated. Neurological examination, particularly in fractures about the elbow, should be carefully made. One should be on the lookout for injuries to blood vessels, and also, which is important, in cases with a major fracture not to overlook a minor one somewhere. Where there is a fractured skull, maybe we have a fractured hip, so a complete skeletal examination should be made. In these days of automobile accidents and terrific collisions, men who treat fractures are sorely put to it in order to fix a patient comfortably with many fractures and with brain injury too.

Personally I believe in skeletal traction as the best means to treat fractures of the shafts of long bones, skeletal traction either by the ice-tong or caliper method or more preferably with the Steinman pin. It takes less apparatus, you get better apposition and union in less time than with any other method I know.

The economic phase enters the treatment of

fractures. A person who is injured and cannot afford to stay in a hospital seven, eight, ten weeks, presents a problem. I recently treated a fracture of the shaft of the femur of a mother of seven children, who was unable to remain in hospital longer than ten days on account of poverty and the necessary supervision her home required. The type of treatment has to be suited to the circumstances of that particular family. In that case I did an operation. There was three inches overriding. The fracture was three or four days old when I saw it. I put on a Sherman bone plate, kept the woman in the hospital ten days, removed her sutures and let her go home and stay for eight weeks before I saw her again, thereby cutting down hospital expense.

In my work the economic phase enters into it largely in many cases. I would have preferred very much to use the Steinman pin on the case just mentioned and to keep her under constant observation, but that seemed impossible.

Speaking of fractures generally, we must make a big distinction between fractures in adults and fractures in children. Nature does wonderful things for little tots with growing bones, and we should not be too much guided by x-ray evidence in fractures in children. Dr. Ashurst has pointed out that even with the gross deformities, particularly in birth fractures that have been untreated, by the time they are eight or ten years of age nature has practically straightened the limb so it can hardly be noticed. We should not try to get too perfect apposition particularly in childhood.

One other point I should mention. Dr. Flanary very properly said that an anesthetic should be used in the reduction of the fracture. Some people are using local anesthetics now, but one can get into pitfalls by using an anesthetic, relaxing the muscles, reducing the fracture with perfect ease, particularly a fracture of the femur or a spiral fracture of the tibia where the fibula is also involved; one pulls them together, puts on splints, and the next morning when the muscles have regained their tone and their pull, one finds that the deformity has recurred. It is in those cases while under the anesthetic that you can slip the Steinman pin through the os calcis or above the condyles of the knee and keep up the extension, and the reduction will be continued.

**W. Barnett Owen, Louisville:** Of course, the general principles outlined by Dr. Flanary are very sound. It would be impossible in one paper to outline the entire regime of treatment of fracture, but there are certain underlying principles that are present in all types of fractures.

The first thing, of course, is the careful examination of the fracture to determine whether or not there is or has been any nerve injury or interference with circulation, whether there

has been a tremendous amount of hemorrhage or whether or not there has been a dislocation of the proximal or distal end of the same long bone that has been broken. In this day and time when we are traveling at such a rapid rate of speed, the fractures that we see are very apt to be multiple. It isn't at all unusual that you have a patient brought to you with a fracture of the arm, a fracture of the shoulder, the spine or the jaw, or maybe a fracture of the femur and dislocation of the hip. All sorts of things might happen. It is very necessary, then, not simply to let your examination stop with the particular fracture for which you have been consulted, as there may be others. There may be other injuries not fractures possibly more severe than the fracture itself; there may be internal injuries. For that reason it is necessary to make a complete general clinical examination.

There is no particular rush, as I see it, about putting on your splints in a fracture. You are going to have the same fracture at the end of a week that you have the first day. How few fractures come to you within the first hour of injury? It is the rarest thing that you see a fracture immediately. If you could see it within the first hour and knew exactly what the situation was and knew what principles you were going to employ and that you were capable of employing and that your facilities at hand would permit you to employ, it would be perfectly proper to make an immediate reduction.

I think we should study our cases a little more carefully.

The x-rays that are taken are sometimes deceiving. An x-ray is only a shadow. It is necessary to get your anteroposterior and lateral views where possible, and where it is necessary, get comparative x-rays, illustrated by a case that we saw recently, such as you all have, fracture of the small bones of the wrist. This particular individual had a fracture of the navicular with a partial dislocation that was treated as a sprain. He had one x-ray picture taken. He had an antero-posterior view of the wrist only. He did not have a lateral view, and he did not have a comparative x-ray of the other wrist. If he had had it would have been very easy to determine the situation. The pain persisted, disability continued, and it was only after a further examination that it was discovered that he had a good deal more than a sprained wrist.

I feel there are two things that are important to look to; 1st, Freedom from pain and 2nd, normal function. Many times you may have an x-ray picture that does not look so good after the bone has united, and still you have a functioning limb and no pain. I would much prefer that to one with complete and perfect anatomical re-position, with a painful useless limb, illustrated by the fact that an old person with a Colles' fracture may have perfect ap-

position, may have perfect bony union, and still have a functionless and painful hand. We have all seen those cases occur. That could be prevented in most instances, (not all,) by the early institution of heat, passive and active motion. Old people do not stand prolonged fixation of the smaller joints very well without very severe resulting immobility, swelling and pain. For that reason, as soon as it is possible to institute early function, the better.

I would avoid radical procedure whenever possible. I think the method employed by the individual should be the method with which he is most familiar, not the imitation of any other man who gets good results with his particular method, but the one with which he has gotten best results himself. After all it is the man behind the method and not the method.

**George A. Hendon, Louisville:** Looking at fractures from a general point of view, I am quite convinced that we have been fed and reared on a doctrine that is not entirely true and is not absolutely sound, particularly in reference to the supposed susceptibility of bone to infection. That probably originated from the fact that in the early history, compound fractures were particularly fatal, and before the days of antiseptics compound fractures meant amputation of the limb, by reason of the fact that infection readily became implanted and made its ravages.

Under our present conditions we have found that bone will resist infection with the same degree or vigor and the same success that fascia will, if the circulation from which the bone derives its sustenance is not interrupted or interfered with. There is no more danger in opening a fracture than there is in operating on a hernia, so far as infection is concerned. I think if we can bring ourselves to subscribe to that doctrine we will in the future open more fractures and in that way restore more injured limbs. We never think anything at all and have no hesitancy in opening the abdominal cavity on the slightest provocation; we ruthlessly wade into the peritoneum. On the slightest provocation we go into the cranial cavity without any conscientious scruples whatever, but I believe that that old superstition that was born of pre-antiseptic days has become an obsession as it relates to the matter of fractures. In gunshot injuries of the abdomen it was formerly preached that it was reprehensible and almost malpractice, to open the peritoneum.

If you are uncertain as to the conditions that prevail in a fractured leg or a fractured arm or any other fracture of a long bone, there is nothing to prevent you from freely and fearlessly invading that region and setting those things to rights in a workmanlike manner, smoothing up the ends of fragments, getting out the devitalized bone, releasing imprisoned nerves, removing the interposing muscles, or doing what-



ever is necessary to make a neat methodical alignment and approximation of the fragments. Approximation, while it is very desirable, is not nearly so essential as alignment. It is ideal to obtain both alignment and approximation, but approximation is by no means essential to the rapid union of fractures, but alignment is. We have seen the femur or the humerus separated by a space that I could put my three fingers in, and as long as those bones were kept in alignment, rapid union, firm and complete union, occurred.

I bring out this point so that in dealing with these conditions you may make your special effort to obtain alignment rather than approximation, but obtain both if you possibly can.

The reason compound fractures are so prone to infection and the reason we are so horrified at an extensive compound fracture is that infection does so frequently occur and its ravages are so hard to control. The reason for that is that the leg or the arm, whatever limb it may be, is perhaps placed in plaster of Paris or in traction or some kind of splint, and the effort to immobilize so vitally interferes with the circulation from which the bone obtains its nutrition that it has no power to resist invasion, it barely has power to survive, to live, but no power whatever to battle with any enemy that might pounce upon it.

**Fracture of Neck of Femur.** Eighty-six consecutive fractures of the neck of the femur are analyzed by Wilson. Thirty-three of these patients are dead, twenty-eight having died in the hospital and five having been discharged from the hospital. Fourteen patients died from cardiovascular disease and nephritis; eight died from bronchopneumonia. Fibrinous pericarditis, lung abscess, cirrhosis of the liver and pyelonephritis each accounted for one death. Three patients died suddenly after reduction of fractures. These deaths were attributed to coronary occlusion or pulmonary embolus. One patient died as a result of a ruptured bladder due to the injury. The cause of death was not recorded in three cases. Sixty-two patients were treated by the Whitman method, seven by extension, three by the Champnier method, and fifteen received no treatment. Of the sixty-two patients treated by the Whitman method, eight died during the treatment. The one patient between the ages of 21 and 30 recovered with bony union; in two patients between 31 and 40 there was healing by bony union; and in the two patients between 41 and 50, there was healing by bony union and in one there was non-union. The percentage of nonunion increases with advancing years. Not one of the seven surviving patients between 71 and 80 showed any signs of repair. In the three surviving patients treated by extension, healing by bony union occurred in one.

## PRE-AND POSTOPERATIVE TREATMENT IN ABDOMINAL SURGERY\*

IRVIN ABELL, M. D.

Louisville.

The actual operation employed in the treatment of abdominal disorders is but a part of the total effort made to obtain a cure. Regardless of the brilliancy with which it may be executed its curative effect may be nullified by improper preparation or inadequate postoperative management. The operation, to the surgeon, may be but an incident while to the patient it is usually an event, ranking in equal importance with the major experiences of life. The cultivation by the surgeon of a proper mental attitude on the part of the patient will make the road smoother for both. The exhibition of a real and personal human feeling will do much to engender confidence in the patient and to allay apprehensions and fears that haunt his waking hours and fill his sleep with disturbing dreams. In an effort to give assurance to patients one should not overlook his responsibility in letting the patient know the risk he assumes. The fallibility of human judgment and the uncertainty of life at times serve to set at naught the safeguards which science has given to surgical measures with the result that tragic and unforeseen accidents and complications must still be reckoned among the possibilities.

In imparting this information it should be tactfully balanced with honest advice as to the value and necessity of the operation in contemplation. The extent of the information accorded the patient must be left to the discretion of the surgeon—usually complete frankness is the best policy, certainly true in operations of election. The family of the patient under any and all circumstances should be fully acquainted with the patient's condition, the risks incident thereto and the possible outcome. The desirable mental attitude on the part of the patient and his family is a grateful recognition that the proposed procedure is a means of obtaining relief from a distressing or threatening ailment and a confidence that it can be carried to a successful conclusion. The proper mental preparation of the patient, at times more difficult of attainment than the physical, has a very definite effect in obviating a disturbing influence on the entire postoperative course.

The routine preparation of every patient should include a thorough physical examination with particular emphasis upon three systems, the respiratory, the cardio-vascular and the renal. Operations upon the abdomen

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

unless coming within the category of emergencies should, in the presence of infections of the nose, throat and chest, be deferred until their subsidence. The occurrence of post-operative complications in the shape of bronchitis, pneumonia, and massive atelectasis can be minimized by such recognition and appropriate delay. The heart, blood pressure and blood should be carefully studied: deficient circulation may so lower the patient's vitality that any one of a number of complications may develop. An adequate circulation is the most efficient prophylaxis against postoperative pulmonary complications. In the presence of disease of the heart it is most important that an estimate of the cardiac reserve be made. It is much safer to recognize the need for, and to administer, Digitalis before operation than to be forced to depend upon its slowly attained effect when confronted with a postoperative cardiac failure. The blood and pulse pressure will give valuable information both as to disease and vital resistance and when varying from normal give leads for further study. The white cell blood count furnishes an index both as to the virulence of infection and the resistance of the patient while the red cell count and the hemoglobin will indicate the desirability of their replenishment by treatment or transfusion as the urgency of the case demands. The examination of the urine should be both chemical and microscopical; in the presence of renal impairment the phenolsulphonphthalein functional test should be carried out and a study of the blood chemistry made. It is believed that many so-called cardiac deaths are in reality renal deaths and when suspicion of renal disease exists, except in emergency, adequate time for preparation should be invariably taken. The presence of sugar in the urine should be checked by a determination of the blood sugar, when, if found above normal, it should be corrected by fitting dietary measures or the administration of insulin as may be indicated.

Patients showing the effects of dehydration and starvation are invariably bad risks and should have their water balance restored by oral, rectal, subcutaneous or intravenous administration of fluids before the institution of operative measures: those showing starvation and acidosis are greatly improved and their chances of recovery greatly enhanced by giving glucose, alkalies and blood transfusions. The method of venoclysis devised by Hendon offers a ready means of safely conveying to the patient such fluid and food medicaments. While age in itself should never be a bar to the relief which we may bring to patients, it must nevertheless never be regarded too lightly. Abdominal opera-

tions on patients 60 years of age and over should be advised only in the presence of a clear indication. That little understood factor, "resistance" cannot be measured and the aged patient who is apparently in perfect physical condition for operation may have a desperate and possibly fatal postoperative course as a result of the major surgery proving too much for a system already definitely weakened by the duration of life.

In elective operations the diet during the 48-hour period preceding operation should be restricted to easily digested foods and a laxative, if administered, should be given at the beginning of the 48-hour period rather than during the 24 hours preceding operation. It should in no event be drastic since the resulting dehydration and active peristalsis contribute much to postoperative discomfort and conceivably may interfere with proper repair and be the forerunner of ileus. Water should be allowed as desired to within two hours of the time set for operation. The rectum should be cleansed by enema on the morning of operation and the bladder emptied a short time before the anesthetic is started. When the patient is unable to void spontaneously the catheter should be used since a distended bladder adds both to the danger of its injury and to the difficulties of technical manipulation if the operation be pelvic in type. When the contemplated operation involves the colon, the purgative should be given four days before operation, after which a bland diet and daily colon irrigations are to be employed. If the colon lesion be an obstructive one preliminary caecostomy with irrigations through such opening will greatly increase the patient's chance of recovery.

Certain surgical diseases of the abdomen require particularly pre-operative care, notably those of the alimentary tract. As a routine liquid or semi-liquid diet should be used previous to operations on the stomach and duodenum. Gastric lavage should precede such operations except in the presence of perforation or active hemorrhage; this is particularly important when the stomach is dilated with gas or fluids. In pyloric and duodenal obstructions this should be repeated twice daily until the stomach is rendered fairly clean before the surgical attack is made. This is particularly essential when chronic pyloric obstruction has resulted in hypertrophy and dilatation of the stomach and also where there is retention of the barium meal given in connection with radiographic studies. With acute high intestinal and prolonged gastric obstructions there is developed an acute toxæmia characterized by a marked fall of the chlorides and a definite increase in the  $\text{CO}_2$  combining power of the blood.



the former varying from an approximate normal of 500 mgm. per cc to 250 and the latter from an approximate normal of 60 to 120. Such a condition constitutes an alkalosis and should be corrected before operation is undertaken. The alkalies which are so efficient in acidosis are contra-indicated. The imbalance in blood chemistry is best overcome by the intravenous administration of sodium chloride; hypertonic solutions up to 20 per cent may be safely given if administered slowly with a dosage of 1-3 grain per each two pounds of body weight. A useful solution for intravenous usage is 10% of sodium chloride and 15 per cent of glucose in 300 cc. quantities. Additional fluids are necessary for a restoration of the water balance. In diseases of the biliary tract, alkalies, fluids and glucose serve to reduce the toxæmia and mitigate its effect upon the liver and kidney. The presence of jaundice adds a grave problem in that the bleeding or clotting time of the blood is delayed due to some change in its calcium content. In addition to the above measures whole blood transfusions and the intravenous administration of 10 cc of a 5 per cent solution of calcium chloride on the three days before operation give some assurance against post-operative bleeding. The duration of the jaundice plays an important part, the longer the duration, the greater the risk from post-operative hemorrhage.

The variety of anesthetics now applicable to abdominal operations is so great that a proper selection for the individual case plays an important part in the safety and mortality of the operation and as well in the comfort of the patient before, during and after operation. Straight ether, nitrous oxide-ether sequence, intratracheal, nasal and colonic ether, ethylene, nitrous oxide, high and low spinal anesthesia, local, paravertebral, sacral and parasacral anesthesia, field block and splanchnic anesthesia, avertin and the preliminary administration of opiates and the barbitol derivatives offer combinations from which a selection fitting to the individual case can be made. Restful sleep free from distressing apprehension can and should be had during the night preceding operation by the employment of some drug of the barbitol group: a repetition of the dose early on the morning of the operation insures a certain degree of tranquillity, renders easier the induction of anesthesia by whatever means selected and decreases post-operative pain, nausea and vomiting. The preparation of the field of operation is readily achieved by a preliminary cleansing of the entire abdominal skin with soap and water and the removal of the hair by shaving. Later the entire field is

painted with a solution of iodine, metaphen or mercurochrome, a final application being made when the patient is on the operating table. With the completion of the operation the aim of the surgeon should be twofold, namely, to spare the patient every unnecessary distress and pain and to correctly evaluate his physical condition and recognize quickly the signs that indicate a change in the normal course, signs which at times may seem trivial and yet which may foreshadow impending disaster. Morphine is the narcotic of choice and is to be given with judgment and discretion; it should be used in sufficient quantity to prevent undue suffering, 1-6 grain to be repeated as needed, but insufficient to interfere with the lung, bowel, bladder, skin and stomach. Patients showing idiosyncrasies to morphine will often-times respond favorably to codeine or pantopon. When the period of acute distress has passed, sleep should be insured, when necessary, by a mild hypnotic of which the barbitol group offer a wide choice. It would seem trite to utter a word of caution regarding hot water bags; the temperature of a hot water bag should be adhered to as rigidly as the dose of a given drug and it should at all times be so covered as to prevent immediate contact with the patient's skin. When the patient has recovered from the anæsthetic, he should be allowed to assume such position in bed as gives greatest comfort. The relaxation of the abdominal muscles is the important factor and may be obtained by the supine position with flexion of the knees, elevation of head and shoulders or lateral position with knee flexion or the prone position. When no contra-indication, such as character of operation or presence of drainage exists, alternating changes in these positions is most gratifying to the patient. Stimulant medication is to be withheld unless definitely indicated. Fluids are to be given by mouth, rectum or hypodermoclysis; by mouth as tolerated beginning six hours after termination of operation. As a rule patients will be unable during the first 24 hours to take by mouth a sufficient quantity to maintain the water balance without inducing nausea: a useful routine measure consists in the administration by rectum during this period of one to three quarts of a solution of sodium bicarbonate and glucose in water, one ounce of each to the quart. When the type of operation prevents the introduction of fluids in this manner or when if so introduced they are not absorbed, a 5 per cent glucose in saline solution may be given subcutaneously in the pectoral and axillary regions. Except when specially indicated such methods of administration may be discontinued at the end of 24 hours and

the patient allowed to take by mouth such fluids as needed.

Regardless of whether anesthesia is induced by local, spinal, or inhalation means a certain number of patients show nausea and vomiting. During the first 24 hours this rarely requires other than simple measures such as restriction of fluid intake and the application of cold to the throat; warm water with the addition of small amounts of soda will often act as a natural lavage and prove efficacious. When the nausea and vomiting become protracted the patient's discomfort is not only greatly increased but the condition constitutes a menace to his safety. Intermittent gastric lavage or the indwelling Levine tube, introduced through the nostril and anchored by adhesive plaster, are most useful; the latter method has the advantage of allowing the patient to drink water freely, the unabsorbed portion returning through the tube without causing painful writhing while at the same time it overcomes the upper abdominal distension and relieves the cardio-respiratory embarrassment dependent upon gastric and duodenal dilatation. At times a powder containing  $\frac{1}{2}$  grain of cocaine,  $2\frac{1}{2}$  grains of cerium oxalate and 1 grain of sodium veronal swallowed on crushed ice at hourly intervals is most helpful.

Abdominal distension is commonly noted after any type of operation within the abdomen and may at times become extremely annoying. It is regarded as a degree of paralytic ileus and usually manifests itself on the second day. The abdominal bandage, if unduly tight, should be loosened. Among the simpler measures employed for its relief may be mentioned the passage of a rectal tube or the introduction of a glycerine suppository. These failing, simple and stimulating enemas, with and without the coincident hypodermic injection of pituitrin and gastric lavage may be relied upon in the absence of marked ileus to afford relief. There is a difference in opinion and in practice regarding the administration of cathartics. Some surgeons never employ them. When the operation has involved suture of the gastrointestinal tract they should not be given within the week. In other instances some patients require nothing more than the enema, some respond to a laxative pill or milk of magnesia, while others constipated by both the opiates and the ileus are made comfortable by castor oil given on the morning of the fourth day. An accurate record of the intake of fluids and the output of urine should be kept. Retention of urine is frequently observed and should be relieved before distention of the bladder causes damage to the mucosa. Heat applied to the pubes, hot water injected into the rectum, or the sound of run-

ning water will at times enable the patient to void spontaneously. Catheterization is to be used with strict technique and great gentleness. When necessary to continue its use some days two to three drams of a 5 per cent solution of argyrol should be left in the bladder night and morning as a prophylactic against cystitis. When a patient fails to regain the power of voluntary micturition within a reasonable time the injection into and retention in the bladder of one ounce of sterile boroglyceride will usually restore the urinary act. With the exception of gastro-intestinal patients a liquid diet may be allowed on third day and if well tolerated, gradually increased to semi-solids with a full tray at the end of the week. Hiccough is at times noted following operations in the abdomen, most frequently after those upon the stomach, intestine and gall bladder. When it persists but for a brief time it has no particular significance but when continuing over a period of days it may be the deciding factor in producing a fatal termination. Its etiology is obscure, the actual mechanism being a clonic spasm of the diaphragm. Theoretically antispasmodics such as belladonna and benzyl-benzoate alone or combined with sedatives such as sodium amytal or morphine should afford control. As a matter of fact they do in most instances while in a few intractable cases they seem to have but little effect. Gastric lavage with hot saline or soda solution followed by a generous dose of morphine alone or in combination with hyoscine is frequently effective. Exposure of the phrenic nerves with crushing by means of forceps pressure has been resorted to in extreme cases.

In clean cases the dressings are changed and the skin sutures removed on the seventh day; stay sutures, if used, are removed on the tenth or twelfth day and the patient allowed to sit up, leaving the hospital on the 14th to 18th day. The character of the operation and the patient's general condition must be taken into consideration and the routine varied as indicated. Wounds in which drainage has been instituted will require dressings at such intervals as may be necessary to take care of the discharge. The use of adhesive strips with attached tapes to retain such dressings will save the patient's skin from the constant irritation of removal. Time prevents a detailed consideration of the complications which may follow in the course of abdominal operations; many of these are commonly observed after operative procedures elsewhere, notably shock, infection, hemorrhage, cardio-renal upsets, pulmonary atelectasis and infections, vascular changes including thrombosis, embolism, infarction and phlebitis and the psychoses.



Acute dilatation of the stomach, paralytic and obstructive ileus are in a sense peculiar to the surgery of the abdomen owing to their greater incidence following operations thereon. Acute dilatation of the stomach can be one of the most distressing of all postoperative complications. Early recognition is a factor of the greatest importance. Symptoms usually develop during the second twenty-four hours: vomiting is persistent and becomes almost constant finally amounting to an almost continuous overflow when the stomach becomes distended and parietic. The degree of distension may be such that the stomach practically fills the entire abdominal cavity, the greater curvature resting deep in the pelvis. The pulse grows rapid, the respirations shallow, the urine scanty, while thirst and dehydration are marked. When recognized promptly the passage of the stomach tube and thorough cleansing of the stomach with warm saline or soda irrigations will usually relieve the symptoms. We personally prefer in all such cases the indwelling Levine tube as it prevents the reaccumulation of fluids and gases and obviates the discomfort of repeated introduction. Glucose in saline should be given intravenously or subcutaneously to replace lost fluids, the heart stimulated if necessary and rest secured by hypnotics or opiates.

Paralytic and obstructive ileus constitute formidable postoperative complications and at times present the greatest difficulty in differentiation. In paralytic ileus there is an inhibition of intestinal muscular motion and stimulation of peristalsis is essential; in mechanical ileus there is a definite intestinal obstruction and stimulation of peristalsis may be fatal. Where the signs of paralytic ileus are clear, distension with absence of acute pain and borborygmus with regurgitant vomiting, gastric lavage with the use of stimulating enemas and the hypodermic administration of pituitrin will usually afford relief. Sodium chloride solution in strength  $2\frac{1}{2}$  grains to each pound of body weight, given slowly intravenously will stimulate peristalsis and theoretically prevent toxic absorption from the distended bowel. Novocain introduced into the spinal subdural space as ordinarily employed in spinal anesthesia is of value in relieving the intestinal inhibition and is a worth-while measure in obstinate cases. Finally enterostomy, jejunal or ileal, has been suggested and employed. The disappointing results of this latter procedure in paralytic ileus are due to the fact that the distended loop of bowel at the site of enterostomy is the only one emptied by it.

Mechanical ileus permits of correction in but one of two ways, enterostomy proximal to the site of obstruction or release of the lat-

ter after its exposure by celiotomy. It occurs after abdominal operations usually as a result of angulation due to adherence of intestine to denuded, injured or inflamed peritoneum. Pain, nausea, vomiting, distension and the presence of borborygmus, unrelieved by gastric lavage and enemas, are the symptoms upon which reliance must be had for recognition; this latter must be reached promptly if either of the two measures mentioned are to succeed in saving life.

#### DISCUSSION

**John H. Blackburn**, Bowling Green: Mr. President, Members of the Association: Dr. Abell has presented to us today another of his characteristically comprehensive papers. He has handled in detail every feature of the pre-operative and post-operative care in abdominal surgery, and he has done it with the same detail and with the same gentleness that he would handle the acutely inflamed tissues in an abdomen.

We recall some two or three years ago that Sir Berkeley Moynihan presented a paper before the American College of Surgeons on "the ritual of an operation." It occurs to me that Dr. Abell has presented to us today the processional and the recessional. He has done it in his usual characteristic manner and has left to us who might discuss it very little to add.

One point particularly that has impressed me is the mental attitude of the patient. I remember a relative some years ago who was to be subjected to an abdominal operation. A friend said to me: "I think you had better stop by and talk to her, she is worrying somewhat."

I stopped by and saw the patient. I said, "Sue, what's the matter? What are you worrying about?"

She said, "What sort of incision are you going to make in this operation?"

I said, "Oh, it will be just a small incision."

"How long will it be?"

"About three inches."

"Where will it be?"

"In the lower abdomen down below the umbilicus."

She sighed and said, "Well, that's all right, but ever since you told me you were going to operate on me I couldn't think of a thing in the world but that picture in the almanac where it's cut across this way and that, and the four corners turned back."

Now Dr. Abell has told us everything, gentlemen, about the pre-operative care except whether the "sign" is right. I don't know whether he goes as far with the sign as some of our patients do.

The Kentucky State Medical Association, gentlemen, will be profited greatly if we who are doing abdominal surgery would give the same detailed care and attention to every phase

of the patient, the complete physical examination, as suggested by Dr. Abell, particularly the mental attitude of the patient, relieving the worry incident to the operation; and incidentally I might say that recently I have gotten a greater relief, a greater feeling of tranquility, and even at times a spirit of "don't care" about the thing by the exhibition of sodium amytal the night before and one or two capsules preceding the operation.

If we would give the same care and attention to our patients after operation, looking after every detail as to the physical and the mental comfort of the patient, recognizing early the possible dangers that might arise incident to some disorder in the circulatory or the renal tract, then we would save our patients a great deal of discomfort. Only recently I had a patient brought in who had a general peritonitis, evidently from a ruptured appendix, a falling blood count, certainly a most unfavorable case for operation. The routine urine examination showed a 4 plus albumin and the urine literally loaded with casts. What was the use of operating on that case? I had been inclined to operate until that urine examination. I just waited, and the Lord took his own. I didn't get the blame for that particular death.

It occurs to me that we gentlemen are to be congratulated on having brought to our attention those little details, those facts that are so essential if we are to give our patients the very best in abdominal surgery.

**Oscar O. Miller**, Waverly Hill Sanitarium: I have enjoyed Dr. Abell's paper immensely. He mentioned specifically in the preparation of the patient, examination of the respiratory tract, the cardiac organ, and also the renal function. There is one point in particular that I should like to stress, and that is the preparation of patients who have bronchiectasis. It is essential that these patients be drained adequately prior to operation, and that facilities be provided for their subsequent drainage after operation; otherwise they develop an interstitial pneumonia due to inadequate drainage.

As to the time of operation (and this refers specifically to patients with tuberculosis), it is a well known fact that many of these patients are depleted in the morning, that they have a subnormal temperature, and I think that this is one of the reasons we have that inevitable 10 per cent mortality in thoracoplasty. I rather think that later in the day when the temperature comes up slightly, it acts as a stimulus to the patient and they bear the operation better.

In regard to singultus, or persistent hiccup, Dr. Abell mentioned a crushing of the nerve. This has been resorted to, but in some of these cases, exposing the nerve and freezing it for a few seconds will produce a paralysis that will extend over a period of a week or ten days, whereas crushing of the nerve produces a

paralysis that extends over a period of six months.

**George A. Hendon**, Louisville: Dr. Abell so generously referred to the source of nutrition I have devised and that has given me a great deal of both pain and pleasure, that I just want to say something in regard to its employment and what it implies. It means the introduction directly into the circulation of a physiological amount of nutriment at a physiological rate. The way we arrive at an estimate of what that is, is based entirely on experience. It is more or less empirical, but the origin of the idea takes root in the investigations that were made by Woodyatt in 1916, when he demonstrated the fact that an animal could take care of, without spilling over, as much as one gram of dextrose to each three pounds of body weight every hour. Therefore, to be safe we use one-half of that amount. For instance if you have a patient who weighs 150 pounds, that patient is capable of taking care of 50 grams of dextrose every hour, which means about 1200 grams in 24 hours, and that means a little over two pounds. We usually start with as much as one pound of glucose in the 24 hours, and we find that dissolved in a 10 per cent solution we can handle it with a great deal more ease than other concentrations.

This can be given over as long a period of time as you desire, and the glucose will furnish a very important resistance in preparation for the operation. We also use this after the operation in serious cases, because by this means we can support our patient for a week or ten days and make a perfect detour of the intestinal tract.

There is one other thought in this connection that does not seem to have impressed itself sufficiently, and that is the fact that people who are seriously sick or in extremis and especially those who are seriously ill as a result of abdominal lesions, have entirely lost the power of absorption in their alimentary canal. The mere introduction of fluid into the gastro-intestinal canal having it retained does not mean that it enters the circulation; it does not, because the mucous membrane has lost its absorbing power. In order to make this impressive to students I have told them that you can fill a patient with fluid from his adenoids to his hemorrhoids and never have a drop of it enter the circulation, so that really, I think, is a good idea to get inculcated into your mind. The mere fact that you are pouring water into a patient's alimentary tract does not mean that the blood stream is getting any of it. In cases of extremis it does not. We sometimes are lulled into a false sense of security not appreciating this fact. By the use of this method that Dr. Abell has called your attention to, we can entirely obviate all the difficulties of absorption and carry the patient for a week to ten days after the opera-



tion if we so desire without calling upon the alimentary canal for any aid whatever.

**Walter I. Hume**, Louisville: I am sure there is general agreement with everything that Dr. Abell has said. We can only emphasize some of the things that were mentioned. Along that line I just want to recall that some years ago I wrote a paper and grossly estimated that 50 per cent or thereabouts of success in surgery depends upon pre-operative and post-operative care of cases. The preparation of cases is immensely important, and Dr. Abell has covered it well, in a very detailed way, and has left little to be said.

Oral sepsis is a thing that strikes my mind as being important. It is amazing to see how filthy the mouths of some patients are who must be subjected to general anesthesia. Perhaps my association with my brother, an exodontist in Louisville, has impressed this upon me particularly. I think one of the preparatory things that should be done regularly is to see about filthy mouths if patients must take general anesthetics.

There is another thing that I think might be added, an extension of the idea that Dr. Abell has already mentioned, that even minor operations sometimes, or stage operations should be resorted to to get our patients in condition. Quite often small septic foci may be removed in getting ready for a smashing major operation and may be the determining factor. In other words, whatever load, mental or physical, is lifted off the patient will help out a great deal in standing the major operation. Even two or three-stage operations will illustrate my idea.

I am quite sure we have lost patients because of incomplete diagnoses, perhaps missing smaller things that added too much to our patients' burden after serious operations. Oral sepsis, I think, is worth seeing about.

**J. Hadley Caldwell**, Newport: I have certainly enjoyed Dr. Abell's paper. It is one of the most instructive papers that I have heard for a long while. He has covered the subject so thoroughly that there is not much to be added. I want only to emphasize one or two points that Dr. Abell made. One of them that made quite an impression upon me was the point that he made about purgation before operation.

When I was an intern some years ago, it was almost a routine procedure to give the patient from a half ounce to an ounce of castor oil the evening he entered the hospital before operation the following morning. I followed that procedure myself for a few years, until I saw my mistake. I think it does a great deal of harm in many cases. It is well to have a mild purgative about 48 hours before, as Dr. Abell suggested, and then an enema the evening the patient enters and one in the morning is sufficient. A drastic purge the night before opera-

tion makes the patient restless, there are peristaltic movements and cramps, and possibly he doesn't sleep any all night. That is the time he should get sleep. I believe the night before operation is the time to make the patient rest, and it generally is well to give some sort of hypnotic. Then that patient is in much better condition for operation.

Also I want to stress the point that they should take plenty of fluids for 48 hours before operation, if it is possible, and this patient will do much better than the patient who has no pre-operative preparation.

Many of the other points that Dr. Abell made I certainly concur in. He spoke of a beginning ileus about the second day after abdominal operation, which sometimes occurs. I follow about the same procedure that Dr. Abell does, with one addition. I have found that if you will give the patient just in the very beginning, when you notice the slight distention of the abdomen, a 3 per cent solution of sodium chloride, hypodermoclysis, about 300 to 500 c.c., and use an enema the following morning, and possibly some pituitrin following, you get excellent results. I believe that many of these cases treated early that way prevent a real paralytic ileus. I believe the reason that works is because there is a deficiency in the chlorides of the blood, and that is the reason for the concentration of a salt solution. We get the same effect with normal salt solution providing the patient absorbs enough, but if it is concentrated up to about 3 per cent it can be given safely under the skin, and I never have had any trouble so far with sloughs.

A year or two ago I ordered this given to a patient, and the intern misunderstood me and gave it intravenously. While there was no harm done as far as we know, I don't believe I would advise giving that concentrated salt solution intravenously.

**Irvin Abell**, (in closing): In the published paper there will be much more said about the proper mental preparation of the patient than, owing to the lack of time, was read. Dr. Blackburn has illustrated the fear which a patient may have, an unfounded one, as instanced by him, of the woman who thought her abdomen was going to be cut like the sign of the Zodiac.

I should like to supplement that with two instances from my own experience. A man was sent to me by Dr. Maddox of Rockport some years ago, with a rather large stone in his kidney. After his examination he declined operation and went home. He came back about six or eight months later, went through his examination a second time, again declined the operation and went home. He repeated this at the end of another year.

I said, "There is no use of your coming back. There is nothing in the world that we can do for you except to give you some urinary anti-

septic, other than to remove your stone. Why is it that you object to its removal?"

He said, "Doctor, I have three brothers. The wife of each was operated upon and in turn each died. I can't get over the horrible fear of death, which this experience engendered."

You can readily appreciate that unless you can eliminate such fear and dread from the man's mind, he will make anything but a desirable surgical patient.

Dr. Withington from the Pine Mountain Settlement School, sent down Bill Nolan. The examination showed that he had a perforating ulcer of the duodenum, with some obstruction in the duodenum. I made an explanation to him of the nature of his trouble and what it would be necessary to do to relieve it. He said, "Doctor, do you mean you are going to cut my gut?"

"Why, Bill, I don't know how to get rid of it unless I do." "I'm going home." I said, "Why?" He said, "I never seen a man up in my neck of the wood that got shot or cut in the guts that didn't die." We must dispel the fear in the patient's mind.

## SYMPOSIUM ON DIAGNOSIS OF HEART DISEASE

### CRITERIA FOR THE DIAGNOSIS OF HEART DISEASE\*

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Louisville.

When requested to give a paper on criteria for the Diagnosis of heart disease, it occurred to me that it would be quite impossible to cover the subject within the short space of time allotted, so I must ask that you pardon any omission, however important, since my words must be brief. The word criteria is derived from the Greek meaning judgment, therefore when speaking on judgment in the diagnosis, I will approach the subject in three ways:

First: General factors which should be remembered in going over the case; some points mentioned here may seem rather elementary, but are indeed important.

Second: Etiology.

Third: A brief review of some of the more common heart diseases from a diagnostic standpoint.

Under general factors, the heart case should be examined in three ways, whenever possible—standing, lying down, and after exercise.

There are six important things to be determined by physical examination:

First: Size of heart.

Second: Diastolic murmurs; I specify

diastolic because most systolic murmurs have no significance.

Third: Blood pressure, and here I would recommend that in taking the blood pressure always to have pulsus alternans in mind; this can be elicited by forcing the manometer well above the point where any sound is heard, then on releasing the pressure very slowly, if say at 170 you hear beats coming through at a rate of about 40 per minute and then on further lowering the pressure 5 to 20 millimeters the rate suddenly doubles it means alternation of the pulse.

Fourth: Congestive failure, the important signs of which are congestion of lungs, edema, and a large liver.

Fifth: Pulse, rate, compare with apex beat; rhythm, regular or irregular, if irregular and at the same time you have periods of regularity or a dominant rhythm it is extrasystoles. If it is an irregular irregularity, that is, no periods of regularity, you have fibrillation. Force, volume, and tension of pulse; state of vessel wall, the amount of sclerosis, best to feel the brachials.

Sixth: The sixth important thing is T-wave interpretation by the electrocardiogram; especially in the aged, where other physical signs may be lacking.

From a series of 10,000 heart cases the four commonest symptoms were tabulated in the order of their frequency:

First: Breathlessness.

Second: Palpitation, especially on exertion.

Third: Vertigo or giddiness.

Fourth: Sternal pain, the term precordial pain is often used but may mean other trouble as dyspepsia or lung conditions; sternal pain more nearly localizes its true position.

There are two different kinds of dyspnea; that seen in mitral stenosis, due to congestion of lungs and is more or less constant. Then we have the intermittent dyspnea, usually coming on at night; this is seen in left ventricular weakness from aortic regurgitation, hypertension, etc. and is a central type, the result of a slow circulation and acidosis, also the excitable threshold of the respiratory centres in brain are much lowered at night and thus easier affected by the transient anemia and acidosis.

Three types of cases have fibrillation; mitral stenosis, arterio-sclerotics, and hyperthyroids; it is seldom seen in other hearts and then only as a terminal factor.

Now, as to myocardial weakness; if there is no valvular lesion, you have the following possibilities:

First: Hypertension.

Second: Meso-aortitis, 50% of these cases have a high blood pressure.

Third: Myocarditis, which means an in-

\*Read in Symposium on Heart Disease before the Jefferson County Medical Society, February 2, 1931.



inflammation of the myocardium, therefore you must have a history of some previous septic illness.

Fourth: Myo-degeneration, this must also have a cause as myocarditis, toxic goitre, pernicious anemia, etc.

Fifth: Sclerosis of the coronary vessels, which is a quite frequent disease and may be diagnosed if the four preceding possibilities can be excluded.

In myocardial weakness there are certain very important physical signs to which I would draw your attention. One is gallop rhythm, which means a third heart sound, usually best heard in the 3rd or 4th interspace somewhere between the left margin of sternum and the apex; this is a very inconstant sign, may be present this minute or day and gone the next minute or tomorrow. Another important sign which is often associated with gallop rhythm is pulsus alternans, the method of eliciting this sign by measurement of the blood pressure has been described. Also, pressure on the vagus in myocardial failure often brings the heart to a standstill, especially where the cause of failure is coronary sclerosis; whereas in other heart lesions, vagus pressure merely slows the rate.

As to the etiology of heart disease, we will enumerate some of the usual causes under the membrane of structure of the heart which that disease usually attacks.

Pericarditis most often follows rheumatism, pneumonia, septicemia, tuberculosis, and cachectic diseases, as chronic nephritis or malignancy.

Myocarditis may be present following rheumatism, diphtheria, typhoid and scarlet fever, influenza, and pneumonia.

Endocarditis occurs in two forms; simple and infective. The simple type usually follows rheumatism or pneumonia. The infective or ulcerative type after general infections as puerperal, pneumonic, or gonorrheal; then we have the sub-acute infective type of unknown origin.

Now, gentlemen, as to the individual heart diseases. I shall briefly describe four which are relatively frequent: Hypertensive,luetie, and rheumatic heart disease, and the anginas.

Hypertensive heart disease is a direct result of high blood pressure, either the essential form or that secondary to nephritis: the heart is overtaxed by the increased work thrown upon it; two important signs in this disease are accentuation of the 2nd aortic sound and enlargement of the left ventricle.

Luetie heart disease, a rather misleading term, as it is very seldom that lues directly attacks the heart; as a rule it is lues of the aorta. Under this heading the most common

cause of failure is aortic regurgitation. A history of burning pain beneath upper part of sternum, to and fro murmur best heard in 2nd right interspace near sternum, difference in pulses and of a water-hammer type are sufficient signs for the diagnosis of specific aortic regurgitation. If I have all of these signs and a negative Wassermann reaction, I would still say specific as the Wassermann is negative in about 1/3 of the cases.

The anginas, the coronary form is due to closure of a coronary vessel by an embolus or thrombus; the symptoms, pain coming on at any time and not related to effort or other outside influences; pain lasts for hours or days and is not relieved by the nitrites. There is cardiac shock and then cardiac collapse, also a unique feeling of muscular inability. Some of the physical signs are a pericardial rub heard 6 to 9 hours after onset, rise of temperature, leucocytosis of 16,000 to 20,000, falling blood pressure, and lastly, electrocardiographic changes, and are most important; however, I do not have time to enumerate them.

Angina from unknown origin, commonly called angina pectoris, causes pain which usually follows exertion, excitement, exposure to cold, or after a heavy meal. Pain generally lasts only 5 to 15 minutes and is relieved by nitrites. There are few physical signs; frequently the blood pressure rises, often there is hypersensitivity to pin-scratch over the precordium, also pain on pressure of eyeball or brachial plexus on the side to which pain radiates.

Rheumatic heart disease, mitral stenosis is the most common valvular lesion under this heading; the two most important signs to look for here are accentuation of the 2nd pulmonary sound and mitral configuration of the heart. By mitral configuration we mean a heart enlarged to the right of the sternum and a "filling-out" of the waist-line on the left. The pulmonary conus and left auricular appendage make up the waist-line and when these portions are dilated there is a "filling-out." If these two signs are positive along with either a pre-systolic murmur, snapping 1st sound at apex, or diastolic murmur, you are justified in making the diagnosis of mitral stenosis.

In closing, just a word as to the very prevalent diagnosis of mitral regurgitation, it is generally agreed among present-day cardiologists that this disease unassociated with stenosis and on an endocardial basis rarely, if ever occurs. I heard the statement made in a Heart Clinic through which some 3,000 cases pass yearly, that in the last 18 years one case of pure mitral insufficiency came to autopsy, and that a result of gunshot wound through the mitral valve; and

incidentally, every case which goes through that clinic and later dies, comes to necropsy.

### X-RAY IN DIAGNOSIS OF CARDIAC DISEASE\*

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The roentgen ray is of decided value in the diagnosis of heart disease, but in itself is seldom diagnostic. The final diagnosis must usually depend upon the clinical findings, the roentgen examination and at times other laboratory examinations, as well.

There are three methods of x-ray examination in general use. The fluoroscope is used very commonly. With it one is able to determine the general contour of the heart. The movements can be studied in various positions and abnormalities in movement, as well as the size and shape, can be noted. An impression of the general condition of the chest is obtained as well as whether or not fluid is present in the pleural spaces.

The second method is that of the orthodiagraph. This is of value in the hands of an expert, but in the hands of an untrained worker measurements are subject to numerous errors.

A third is that of the so-called six foot film, films being made with the x-ray tube at a six or seven foot focal distance. This is used commonly and is very accurate. The distortion of the heart shadow due to magnification from the projection is very slight at these distances. These films give an accurate and permanent record of the size and general contour of the heart, as well as some idea of the condition of the chest. Most examiners recommend that the exposure be sufficiently long to include one entire cardiac cycle. By this means the outline of the heart in diastole is obtained, this being the most satisfactory for measurement. The usual position is the postero-anterior, but semilateral positions as well may be used.

Normally, the left border of the cardiac shadow is made up largely by the left ventricle. Immediately above it, at times, there is a slight protuberance due to the left auricle. However, the left auricular area frequently is not seen under normal circumstances. Just above this area is that due to the pulmonic vessels and at the highest point is the shadow of the aortic arch. Immediately over the right side of the diaphragm is seen the right side of the heart shadow, made up almost entirely by the right auricle. Above it is the shadow of the ascending aorta. Normally the transverse

diameter of the heart is less than one-half the diameter of the chest. There may be a very few exceptions to this rule, especially in athletes and in some persons doing very hard manual labor. However, even in these instances, the above standard usually holds true.

### PATHOLOGY

Several congenital conditions can be demonstrated by the roentgen ray. One often seen is a patent ductus arteriosus. This is shown by unusual prominence in the pulmonic area. A patent foramen ovale is very common but cannot be demonstrated by x-ray and in most instances has no clinical significance. Stenosis of the aorta or pulmonic artery is indicated by unusual size of the aortic or pulmonic area respectively. This may also affect the general cardiac contour. Absence of the interventricular septum does not result in any very characteristic changes in the cardiac contour, except for unusual fullness of the shadow of the right side, together with generalized enlargement.

Evidence of valvular disease can usually be shown. Of this group the most frequent and most characteristic changes are seen in mitral disease. Ordinarily this is shown by unusual prominence of the shadow in the left auricular area, usually together with generalized cardiac enlargement. The fullness in the auricular area may be demonstrated long before the enlargement takes place. Late in mitral disease there is a disproportionate increase in the size of the right side of the heart over the generalized enlargement and there may be evidence in the chest of chronic passive congestion indicative of heart failure. Involvement of the tricuspid valve may take place and is seen most frequently in rheumatic heart disease. However, it is very uncommon to find only this valve affected. This results in no x-ray changes that are entirely characteristic, but may be responsible for unusual prominence of the right side of the heart shadow. Rheumatic or luetic infections of the aortic valve cause generalized enlargement of the cardiac shadow, most marked in the left ventricular area. In hypertension the heart may be enlarged, the major increase in size being in the left ventricle. Aside from this, the changes are not characteristic of this condition and they may very closely resemble those seen in aortic disease.

Myocarditis usually is followed by enlargement of the heart. In this condition, the appearance of the cardiac shadow frequently suggests a loss of muscle tone. The margins of the shadow have a tendency to be concave rather than convex and often are less sharply defined than normal. Aneurysms may be found at times in the heart itself

\*Read in Symposium on Heart Disease before the Jefferson County Medical Society, February 2, 1931.



where they are very seldom demonstrated. They are common in the proximal part of the aorta but may be found in any part of this structure. These are due to weakening of the wall of the aorta, usually the result of disease. By x-ray they are shown as shadows projecting from the lumen of some part of the aorta. Usually the shadows are sharply defined and pulsating. Pulsation may be absent when they contain an organized thrombus. It is often very difficult to determine whether pulsation is actually present or whether the apparent pulsation is simply transmitted motion from pulsations of the heart and great vessels. Aneurysms may result in destruction of adjacent bone by pressure. This is most often seen in aneurysms of the descending aorta where destruction of the vertebra may be seen early in the course of the disease. Destruction is also seen at times in the sternum, ribs and clavicle.

Both luetic and non-specific aortitis can frequently be demonstrated by x-ray. The appearance of the two conditions is not sufficiently characteristic for one to be certain which is responsible for the changes noted. Usually in a luetic aortitis there is dilatation of the ascending portion of the aorta, with consequent narrowing of the posterior mediastinal space in this area. In non-specific aortitis, generally due to arteriosclerosis, the aorta is often elongated with consequent abnormal prominence of the arch just to the left of the midline. However, when viewed in the semilateral position the aortic shadow will be found to be normal in diameter. In some instances with advanced arteriosclerosis, there may be very definite increase in the diameter.

Pericarditis may also be diagnosed by x-ray but at times quite a large amount of fluids may be present in the pericardial sac without being demonstrated. Ordinarily pericarditis results in increase in the size of the cardiac shadow and in some instances the appearance of the shadow is rather characteristic, being of the so-called water bottle variety. Usually an increase in the diameter of the base of the cardiac shadow is noted when films are made with patient prone. Together with these changes, there may be lack in the definition of the margins of the shadow and associated inflammatory changes in the chest.

Cardiac decompensation frequently results in abnormalities that can be shown by x-ray, aside from those in the shadow of the heart itself. Chronic passive congestion is one of these. It results in diffuse, mottled areas of increased density scattered throughout both lung fields and in some instances may be confused with a generalized tuber-

culosis or a bronchial pneumonia. A hydrothorax may also be demonstrated at times.

The above conditions are some of those that may be shown by x-ray. However, it must be borne in mind that many of them are subject to variation and at times may be simulated by other abnormalities not of cardiac origin. The most accurate and satisfactory results will obtain where there is close co-operation between the roentgenologist and the physician directly responsible for the management of the patient.

#### OPERATIVE RISK IN HEART DISEASE\*

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The statement has been made that patients with cardiac disease stand general anesthesia as well as normal individuals. Were this true there would be no reason for the present discussion. While real cardiac cripples do often undergo operations without apparent injury experience indicates that there is danger. More than eight per cent, possibly even ten per cent, of all normal adults present heart murmurs which are sometimes erroneously interpreted as indicating disease. Because such individuals pass through major operative procedures without difficulty has led to the mistaken idea that no actual risk is encountered in anesthetizing heart cases. Until it is firmly fixed in our minds that a mere murmur does not necessarily indicate heart disease the erroneous idea expressed in my opening sentence will persist.

Though often repeated in recent years I would again call attention to the fact that a murmur alone is not necessarily indicative of an organic heart lesion. This is emphatically true with reference to systolic murmurs and to a lesser degree it is true of diastolic. Morse (1) has called attention to the functional aortic diastolic murmur occasionally found in children. These functional diastolic murmurs show downward transmission and may be heard at the apex so that considerable care must be exercised in differentiating them from the organic lesions. A murmur merely arrests our attention and requires us to make a thorough examination in the search for positive evidence of heart disease.

In an individual under forty years of age at least one of the following conditions must be present before a diagnosis of organic heart disease can be made:

(1) Cardiac enlargement; (2) a definite purring thrill at the base either to the right or the left of the sternum; (3) a definite purring thrill in the apical region; (4) con-

\*Read in Symposium on Heart Disease before the Jefferson County Medical Society, February 2, 1931.

stant elevation of either the systolic or diastolic blood-pressure; (5) definite alternation of the roentgen cardiac silhouette; (6) complete heart block; (7) definite signs of a mitral stenosis; (8) definite signs of an aortic insufficiency; (9) aortic aneurysm; (10) a definite anginal syndrome or a status anginosus. In persons over forty years of age the heart may be normal in size with no abnormal physical signs detectable yet it cannot be considered sound if easy fatigue or breathlessness is manifest at rest or after slight exercise. Fortunately electrocardiograms furnish unmistakable evidence concerning the state of the myocardium in these cases. Were electrocardiograms routinely made in individuals over forty years of age an explanation would be at hand for the sudden deaths that sometimes occur during or following general anesthesia.

From the standpoint of the operative risk an exact etiological diagnosis of the heart condition is important. Rheumatic heart cases with mitral stenosis and auricular fibrillation must receive local anesthesia for safety while thyroid heart cases with auricular fibrillation may be given a general anesthetic if they are frightened by the thought of being conscious during the operation. However, local anesthesia should be the method of choice in thyroid operations regardless of whether the heart has been affected or not.

Hypertensive cardio-vascular patients may receive ether alone or preceded by nitrous oxide with plenty of oxygen to avoid any tendency to cyanosis. Local anesthesia is, of course, preferable and particularly should this method be employed if there is any tendency to congestive heart failure as determined by a history of breathlessness, oedema of the lower limbs or the presence of rales at the lung bases posteriorly. Likewise a history of pain in the upper abdomen or chest or numbness of the arms provoked by exercise, indicative of the anginal type of failure, demands the use of a local anesthetic. In hypertensive cases chloroform or spinal anesthesia should be avoided because of the marked fall in blood-pressure which usually accompanies their use. I am well aware that certain surgeons advise spinal anesthesia in hypertensive individuals. However, it has been proven that the constant accompaniment of an essential hypertension is a generalized arteriolar sclerosis. In fact the arteriolar change probably precedes and is responsible for the elevation of the pressure. Thus in order to prevent cerebral anemia, which would result from the decreased blood supply through narrowed arterioles, the pressure is elevated. Since cerebral anemia is apparently the cause of

death in spinal anesthesia it does not seem logical to court possible disaster by employing a method which would cause a sudden and prolonged reduction in blood-pressure thus destroying a protective mechanism.

Arteriosclerotic heart disease patients with frank coronary involvement as manifested by an anginal syndrome or a history of a status anginosus are bad surgical risks and should be operated on only under local anesthesia. The local anesthetic solution used in such a case should not contain any epinephrine for two reasons, the first being that sympathetic stimulation is induced which results in a tachycardia and the second being that vasoconstriction occurs with a resulting elevation of blood-pressure. Even for extraction of teeth in such cases I have for years advised exodontists to use no epinephrine. The possible danger is emphasized by a case recently reported by Cottrell and Wood (2) in which a diagnostic injection of epinephrine was promptly followed by a coronary thrombosis.

Usually patients with any one of the various cardiac arrhythmias may be safely anesthetized by means of a general anesthetic provided the irregularity is not an accompaniment of an organic defect. Individuals with the various types of premature contractions often exhibit a reduction or cessation of this type of irregularity with the acceleration of the heart rate accompanying the earlier stages of the anesthesia. Younger individuals with a heightened degree of sinus arrhythmia may have this accentuated to an abnormal degree at the beginning of the anesthetic, particularly if ether or chloroform is not preceded by nitrous oxide-oxygen. The rapid administration of a strong vapour may result in marked slowing of the heart rate caused by the vagal stimulation arising from the irritation of the nasal sensory nerve endings by the vapour. Recently a contemplated tonsillectomy was postponed because of the alarming slowing of the heart by such reflex vagal stimulation. We were able to demonstrate the mechanism electrocardiographically and to assure those concerned that there would be neither untoward symptoms nor danger by a nitrous oxide-oxygen-ether sequence or slow administration of plain ether.

A grave danger arises in all heart cases if a general anesthetic is improperly given and struggling occurs with consequent interference with the circulation. A stage of excitement is frequently followed by subnormal breathing, cyanosis and even partial asphyxia with deleterious effects on the patient. Therefore, it is imperative that methods be employed which will prevent or lessen the stage of excitement. It would seem



highly important in all heart cases to give a preliminary hypodermic of a full dose of morphine sulphate at least forty-five minutes prior to the beginning of the anesthetic whether a local or a general anesthetic be selected. Then if general anesthesia is to be used the elimination of the stage of excitement may be secured by careful induction whether nitrous-oxide-oxygen, ethylene or nitrous oxide-oxygen-ether is employed. Despite the idea expressed in some of the older text books that chloroform should be used in aneurysms I am convinced that there is no valid reason for its use.

Several years ago preliminary digitalization was advised prior to all major operations whether or not any heart lesion existed. Such a procedure is not only unnecessary but possibly even dangerous under certain circumstances. Unless auricular fibrillation is present or congestive heart failure is manifest digitalis should not be given pre-operatively.

Patients showing venous thrombosis must be handled in a most careful manner. The use of local anesthesia is imperative in such cases.

Schleich's (3) postulates, while recommended as general axioms for all surgical cases, are especially applicable when dealing with patients having heart disease. Freely translated these postulates are as follows.

(1) A general anesthetic is to be used in operative conditions in which the danger to life by not operating is greater than the risk assumed by the use of the anesthetic agent.

(2) A general anesthetic is to be employed only, when in no other way, the relief of pain at operation can be secured.

(3) With every general anesthesia which is unavoidable the ease should be handled as one of the few for whom the anesthetic was especially dangerous.

#### SUMMARY

1. An added degree of risk is ever present in operations performed on cardiac cripples.

2. A murmur alone is not necessarily indicative of an organic heart lesion.

3. The basis for a diagnosis of organic heart disease is stressed.

4. A complete appraisal of the condition of the crippled heart from an etiological, as well as from a structural and functional standpoint is necessary before operative intervention.

5. Electrocardiograms may furnish the only evidence of myocardial involvement in patients over forty years of age.

6. Local anesthesia is by far the safest type in heart disease.

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## THE TREATMENT OF HEART DISEASES\*

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As the subject assigned me, "The Treatment of Heart Diseases," covers such a large field, I will limit my discussion mostly to the chronic myocardial diseases and the chronic valvular conditions and say very little about the acute inflammatory diseases of the heart.

**Chronic Cases:** When we consider that heart diseases contribute about fifteen per cent of the total number of deaths from all causes, we should realize the importance of early recognition of cardiac diseases and appropriate instruction and treatment instituted. In the earlier stages heart diseases may be asymptomatic and without signs, but when the heart is no longer able to maintain an adequate circulation during the usual exertion and activities, symptoms of heart failure supervene.

This inability to maintain an adequate circulation results in disturbed blood distribution: a deficiency on the arterial side, and even more important, a concomitant excess in the venous side; with further advance of this condition to the point where the heart cannot efficiently propel the blood through the vascular system, except when the patient is perfectly at rest, cardiac decompensation occurs.

Cardiac efficiency may be impaired by three main types of lesions acting singly, but often in combination, ultimately leading to cardiac failure: (1) Muscle damage, (2) valvular disturbance, (3) disorders of rhythm. Low systolic blood pressure together with low pulse pressure is a definite sign of a failing heart. Gallop rhythm and pulsus alterans are very grave signs of heart failure and are evidences of serious myocardial damage.

There is no drug therapy yet devised to improve the condition of scarred valves in chronic valvular disease. Prevention of further infections which are apt to damage the valves is of prime importance in individuals with chronic valvular diseases. Prophylaxis designed to control conditions liable to cause further damage to diseased heart; protection of the heart against over taxation; and increase the cardiac efficiency.

Of greatest importance is prevention of the factors which produce chronic valvular dis-

\*Read in Symposium on Heart Disease before the Jefferson County Medical Society, February 2, 1931.

ease, and the earlier prevention treatment is instituted the greater the prospect of its effectiveness, which emphasizes the importance of frequent periodic health examinations.

Careful search should be made for all evidences of general or focal infection, chronic intoxication should be eliminated; the use of alcohol interdicted; over-indulgence in coffee, tea and tobacco checked; intoxication from the digestive tract controlled by appropriate therapy and regulations of diet. General hygienic measures are to be adopted in order to avoid acute infections. Physical and mental exertion, worry, anxiety, anger and haste, as well as dietetic indiscretions, over-indulgence in food and the lack of sleep and rest are all potent factors in over-taxing an impaired heart. A patient having an organic heart disease does not necessarily mean we must medicate him, as some heart lesions will take care of themselves for a long period with proper living, etc.

It must be remembered that symptoms of cardiac insufficiency do not appear until the lesions are already established and severe, and is the result of diminished mechanical efficiency of the heart.

Treatment of heart diseases is almost always an individual problem and we must consider our patient, his symptoms, etc. rather than a labelled heart case.

#### SUMMARY OF TREATMENT

**Rest:** Prolonged, complete rest in bed is the most important therapeutic measure in heart disease, especially with fever from active endocardial lesions or any other source.

**Exercise:** Graded exercise should be started after the patient has had sufficiently prolonged rest to build up the cardiac reserve. It should be kept within the patient's tolerance.

**Diet:** The diet should be simple and easily masticated, but not too restricted. Heavy meals must be avoided. Irritating foods and those that produce gas should be restricted. With edema present, fluids should be limited to 600 to 1000 c. c. daily, depending on the condition of the patient. Salt should be reduced to a minimum when edema is present.

**Symptomatic Treatment:** In severe dyspnea with cyanosis and distended cervical veins immediate venesection of 300 to 500 c. c. of blood brings relief. For embarrassment to respiration from hydrothorax, hydropericardium or marked ascites, paracentesis is indicated, but too much should not be removed at the first aspiration.

**Insomnia:** Rest and quiet is necessary. Bromides, chloral, or some of the hypnotics, especially phenobarbital in hypertension, are good.

**Pain and Restlessness:** Morphine in about 1/6 to 1/4 grain doses, or ecclen in 1/2 grain doses, should be given to obtain proper relaxation. Hyosein combined with morphine is sometimes valuable in controlling severe cardiac psychosis.

**Digitalis Therapy:** No drug can compete with digitalis among cardiac drugs, but be sure a good preparation which has been physiologically tested is used. Its indications are as follows:

1. Cardiac decompensation with auricular fibrillation.

2. Cardiac decompensation with hypertrophy associated with regular rhythm, rapid or slow.

3. Auricular fibrillation with or without decompensation.

4. Valvular heart disease with signs of failure, irrespective of valves affected.

5. In complete heart block, it improves the coronary circulation and may increase the heart rate.

6. In auricular flutter it is of value to change the flutter to fibrillation and then to slow the rate.

If the heart is completely decompensated and can still mobilize some reserve force, the circulation is greatly improved by digitalis and the heart will compensate; the symptoms disappear and the edema and anasarca gradually subside through diuretic action of digitalis. It induces diuresis only with edema. Its direct action on the kidneys is slight, the diuresis being caused principally through the improved circulation.

Digitalis is generally given in altogether too small dosage, but occasionally it is given in too large dosage. The Eggleston dose should be given very cautiously. Give the tincture by mouth, the initial dose being about 4 c. c. and 2 c. c. every 4 to 6 hours until one-half the Eggleston dose (one-seventh of the pound body weight in c. c.) is given. After that from 1 to 4 c. c. daily is given until the heart is digitalized and the desired effect is obtained. Usually the pulse declines to about 70 per minute. The average subsequent tonic dose is 1 to 2 c. c. daily, continued almost indefinitely, but always under observation. The modified rapid method of digitalization with 1.5 gm. of powdered leaf or 15 c. c. of tincture per 100 pound body weight is indicated in divided doses over a period of four days, giving two-thirds of the total the first day, one-sixth the second day, and the other sixth during the third and fourth days. The above dosage is indicated only when the drug has not been given prior to the institution of treatment; otherwise the dosage must be modified by making the necessary allowances for previous administration.



Decompensated patients who develop nausea and vomiting cannot tolerate digitals by mouth, and they should be given the drug in about the same dosage, but administered in 50 to 100 c. c. of water or normal saline by rectum as retention enema divided in one or two doses. Hypodermic or intramuscular injections are given only when the other two routes are not available, and intravenous administration should be given only where an immediate effect is absolutely indicated. The cumulative effect of the drug must be borne in mind.

An ice bag over the heart is of considerable service at times in cardiac distress and tachycardia. Small blisters are sometimes advantageous and counter-irritation with mustard plaster often gives relief.

Quinidin: The place of quinidin in the treatment of heart disease still remains unsettled, but experience indicates that it is of value, especially in auricular fibrillation and to a less extent in paroxysmal tachycardia. It is most effective in early fibrillation but is also valuable in many chronic forms.

Before instituting quinidin treatment an initial dose of the drug, 3 grains in capsules, should be given to test for hypersensitiveness or idiosyncrasy to the drug. The disagreeable symptoms from quinidin include vertigo, tinnitus, headache, nausea, vomiting, nervousness and tachycardia; severe symptoms require cessation of the drug. A normal rhythm may be established with 6 to 12 grains daily.

Strophantus, in this country, is used very infrequently. Its action is similar to that of digitalis.

Iodides: These are of value in luetic mesoaortitis with or without decompensation. In hypertension the benefits are questionable.

Caffein: Caffein sodium benzoate, 3 to 7 1/2 grains subcutaneously is helpful at times, especially when the kidneys show evidence of failure.

Euphyllin: This is a valuable coronary vasodilator. It is the drug of choice in coronary disease with or without angina pectoris. It is given dissolved in water in doses of 1.5 grains 4 or 5 times daily.

Nitrites: The nitrites lower blood pressure. Amyl nitrite works quickly and is indicated in attacks of angina pectoris. Nitroglycerin and erythrol tetranitrate act more slowly and have more lasting effects.

Strychnine: Sulphate strychnine 1/30 to 1/20 grs. hypodermically, especially in conjunction with caffein or digitalis, proves effective at times in cardiac conditions.

Epinephrin: This causes a rise of blood pressure through stimulation of the peripheral end of the sympathetic nervous system causing vasoconstriction. In the heart

it also stimulates these endings, causing an increased rate and increase of myocardial irritability. Hence its intracardiac use in cardiac arrest during anesthesia, Adams-Stokes syndrome, etc.

Ephedrin: Its action is similar to that of epinephrin, but is less quantitatively and more prolonged. It is effective by mouth.

Iron-Arsenic: When anemia is a marked feature iron should be given in full doses. Arsenic is an excellent substitute and one or the other or both should be administered.

There are many other drugs used in diseases of the heart but I will only mention them in this limited paper: Camphor, atropin, pituitary extract, ammonia, alcohol, calcium, etc. are all used at times in diseases of the heart.

I have endeavored, in this discussion, to cover, in a limited way, the outstanding indications in the treatment of the chronic heart diseases and hope this will be a means of inducing a more detailed discussion of this most important condition which we all see so often in our every day practice.

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#### DISCUSSION

V. E. Simpson: Every observing clinician has been impressed by the uniform desire of patients with congestive myocardial failure to sit upright and the added relief from the dyspnea resulting therefrom. Concerning this clinical observation an adequate explanation has aroused the curiosity of many investigators.

The commonly accepted explanation of orthopnea in myocardial failure prior to forty years ago was that the accessory muscles of respiration could be used to better advantage in the sitting posture. But in 1891 Aron observed that the negative intrathoracic pressure is less in the recumbent than in the sitting posture. In 1894 Sahli sought to explain cardiac orthopnea on the basis of more advantageous use of the accessory muscles of respiration, the relief, by gravity, of venous congestion of the brain and the diminished pulmonary congestion by accumulation of blood in the lower extremities. To this view Hill in 1895 added the factor of drainage of a large quantity of blood into the splanchnic area thus relieving pulmonary congestion.

This was the status of medical opinion when I began medical practice in 1903. That the explanations were inadequate is evidenced by the sustained interest in the problem. Then Hofbauer in 1907 showed that the embarrassment experienced by orthopneic patients was expiratory, not inspiratory. His explanation of cardiac dyspnea was founded on a mechanical basis: (1) that in the upright posture the diaphragm was lower, augmenting the capacity

of the thorax which increased the elastic tension of the lungs and thus facilitated expiration, (b) that the negative intrathoracic pressure was increased by the upright position and thus aided the maintenance of blood flow through the lungs, (c) that the quadrilateral foramen has a maximum aperture when the body is erect and, therefore, offers no obstruction to the return flow of the inferior vena cava, (d) the pumping action on the viscera and vena cava of the abdominal muscles attains its maximum when the body is upright.

The next step in the newer field of research was made by Bohr in 1907 when he found that the vital capacity, reserve air and middle capacity of the lungs were decreased by recumbency. His observations concerning the vital capacity have been confirmed, especially by Christie and Beams 15 years later when they reported their observations on normals. They found the average vital capacity sitting was 5.5 per cent more than when recumbent and that patients with orthopnea showing a reduction of 69 per cent from the estimated normal loss and additional 26 per cent on lying down.

Haldam and Priestly some three years previously, had discussed the mechanism of respiration in sitting and recumbent postures and had introduced the term anoxemia in their explanation of orthopnea of myocardial failure. In such patients the blood leaving the lungs is not as well oxygenated in the recumbent as in the sitting posture and partial asphyxia of the respiratory center obtains.

The next factor thought to help explain orthopnea concerned studies on the minute volume output of the heart which work began to bulk large in the literature from 1925 with the work of Field and Bock and Henderson and Haggard. This phase of the study continues to the present time but with singular diversity of conclusions. Some find the minute volume output to be as much as 25 per cent more in the sitting posture than in the recumbent, while yet others find a fairly constant output recumbent, sitting and standing.

The last hypothesis of orthopnea in congestive heart failure was offered by Ernstene and Blumgart and assumes that the orthopenic position benefits the patient by affording a maximum blood supply to the respiratory center and lessening the asphyxia of that area.

The mechanism by which this is accomplished is that to be explained by the following facts and premises. The blood in capillaries is dependent on the pressure gradient in these vessels. An increase in arteriolar pressure increases capillary flow while an increase in the vessels lessens it. Increased venous pressure, therefore, promotes stagnation of blood which means anoxemia. The peripheral venous pressure increases roughly with the degree of myocardial decompensation. Since there are no

efficient valves in the veins between the right auricle and the cerebral capillaries it must follow that when recumbent the venous pressure at the right auricle is the same as the venous pressure in the region of the respiratory center. This causes a slower blood flow in the capillaries of the respiratory center and stagnation anoxemia results. But if the head is elevated as much as 15 cm. above the level of the right auricle then the pressure in the veins of the center approaches zero, the capillary flow toward the veins is increased, a more adequate blood supply to the respiratory center obtains and the respiratory distress relieved.

Engorgement of the jugular veins as high as the angle of the jaw when recumbent is a common clinical observation; when upright this engorgement rises but little above the clavicle. Ernstene and Blumgart found that to secure relief from orthopnea it was necessary to raise the head only so as to place the respiratory center 15 or more cm. above the right auricle. To phase it in other terms, an elevation of the respiratory center above the meniscus of the column of blood in the jugular veins will maintain the flow of capillary blood in the respiratory center as efficiently as an existing myocardial weakness permits.

**A. W. Nickell:** This is one of the most interesting subjects that has come before the society in many years. I want to thank the program committee for this and the many other interesting symposia that have preceded this one.

Heart disease is the greatest problem we have today. From the standpoint of mortality and morbidity it comprises from 6 to 8 per cent of the cases that are taken care of every day.

Mortality statistics disclose that of all reportable diseases 3 per cent are heart cases, therefore the important relation that heart disease bears to the whole problem of morbidity and mortality is very obvious. We do not pay sufficient attention to the etiology of heart disease. Some time ago Halsey made a survey in the state of New York to ascertain the causes of death in heart disease, for example: how many people died of rheumatic heart disease, how many of syphilis, and how many of other diseases of the heart. Of 30,000 deaths, only 2,000 could be accounted for on the basis of etiology. In 1922 it was found that 34 per cent of death certificates assigned the cause of death to chronic myocarditis, and in 1926, 48 per cent of deaths were assigned to that cause. A review of Burwell's article, which is a splendid contribution to the literature, confirms the rest of our investigations in this important field of internal medicine. Heart disease, which heads the list in the cause of death today, also causes a great amount of crippling and illness of one kind or another.

What the profession needs to do in prevent-



ing or postponing death from heart disease, is to prevent the occurrence or endeavor to reduce the severity and duration of the conditions leading to heart disease. The best way, then, to attack this problem is to combat acute rheumatic fever, hypertension, and syphilis. Considerable is known about the effects, but not much about the cause, of hypertension. We know so little, in fact, about the etiology of hypertension that it reminds us of our ignorance of diabetes before its basis was demonstrated in pancreatic dysfunction, therefore little can be done with our slight knowledge of hypertension about controlling it and practically nothing about curing it. It causes so many cases of heart disease that when an understanding of hypertension has been gained and translated into preventive measures, a long stride toward the control of heart disease will have been made. The outlook regarding rheumatic fever is a little more encouraging. The many sides and angles from which it is being attacked gives us more hope of prevention and cure.

We have reason to believe that by beginning early with intelligent and prolonged treatment of syphilis by methods we have at our disposal, that there will be a great reduction in the incidence of syphilitic heart disease, if early syphilis is treated well. However, let us not forget to encourage investigation of the many lesions which cause heart disease, especially the three just mentioned: acute rheumatic fever, hypertension, and syphilis.

There are other things that lead to heart failure aside from valvular defects and myocardial pathology, and it is to that side of the picture we must look for future hope. The recent observations of Aschoff and Tawara emphasize the fact that most cases of cardiac failure are not to be explained on the basis of anatomical lesions which can be demonstrated in the muscle. If such lesions were the only basis of failure, the problem of treatment would be beyond our solution. If we agree that the heart muscle is at fault, and cannot assign any structural defects as a basis for failure we may turn our attention to functional changes where there is some ground for hope, because functional changes are often reversible. What functional alteration in the muscle can be blamed is unknown, but reversible changes are known which are associated with certain cases of heart failure, says Burwell. Zondek and other workers find that certain cases of heart failure are associated with myxedema, and the heart symptoms are relieved by the administration of thyroid substance.

In cases of heart failure associated with beriberi, the condition has disappeared by administering vitamin B. This, as claimed by research workers, illustrates functional change in the myocardium, severe enough to cause the

trouble, and yet reversible by simple treatment. The hope which animates the workers is that some functional change along this line will be an important factor in heart failure associated with valvular disease and high blood pressure.

In Vienna workers have observed a reduction in calcium and in lipoids in the myocardium of individuals dying of heart failure. Some have demonstrated a diminished amount of potassium content of the heart and ascribe this to fatigue of the muscle. As Smith has said, can we not perhaps hope that the problem of heart failure in the early stages will be solved some day by better understanding of heart tissue chemistry? I think therein lies our only hope, for after the heart valves and muscle are crippled our work in the main consists of palliation, but again, as Calvin Smith has stated, and our own experience confirms some of these findings, that magnesium has seemed effective in some patients who have multiple premature systoles; also calcium properly administered, will arrest some cases of auricular fibrillation; barium has been beneficial in heart block.

Other patients with high blood pressure levels who have been on restricted diet for months, and improvement when a change of environment is advised with a more comprehensive dietary, may those benefits not occur from furnishing the heart muscle fibers chemical replacement of substances from these different foods and water?

Let us hope that more effective work and progress will be made in this important field of cardiac research.

**Emmet F. Horine**, (in closing): One of the gentlemen, if I understood him correctly, intimated that a dosage of 1/100 of a grain of atropin sulphate would paralyze the vagus. May I call attention to the fact that this dose of atropin does not cause cessation of vagal influences. In fact its primary effect is to stimulate the vagus and thus cause accentuation of vagal effects. All this can be clearly demonstrated by electrocardiographic observation. If vagal activity is to be abolished much larger doses must be given. In fact I question whether vagal activity can be abolished unless a 30th of a grain or more is given.

The routine administration of the barbituric acid derivatives prior to anesthesia is questionable. These derivatives are all depressant and they have a very definite tendency to lower blood pressure. In good operative risks there should be no real objection to the administration of this group of drugs. But with individuals with real heart disease or poor risks in general the barbituric group should undoubtedly be avoided even by oral administration. In such cases the intravenous administration is certainly absolutely contra-indicated. My impression is that when more is learned of the side effects of the barbituric acid group of

drugs their preoperative use will be restricted to selected cases.

The value of the x-ray examination of the heart has been thoroughly discussed by one of the essayists. It can certainly be stated that no examination of the heart is complete without x-ray studies.

The treatment of cardiac disease has been thoroughly summarized by Dr. Frankel. I quite agree that quinidin has an important place in heart affections especially in paroxysmal auricular fibrillation complicating any type of heart disease. We have elsewhere considered the indications and contraindications for quinidin so that I shall not enter into a discussion of this at the present time.

To the list of drugs already mentioned by the essayist as used in heart disease barium chloride should be added. In heart-block complicated by Stokes-Adams seizures barium chloride given in a dosage of 1-3rd of a grain three times daily may entirely abolish the seizures. This drug has been particularly efficacious in selected cases.

#### THE EFFECT OF DISEASE UPON THE CALCIUM CONTENT OF THE BLOOD\*

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An increasing interest has been shown in the mineral metabolism of the body within the last few years.

To understand the effects of disease upon the calcium content of the blood it is necessary to have some idea as to the function of calcium in the body, the effects of an over supply and of diminished amounts in the blood stream. One should also know something about the absorption and excretion of calcium as well as the effect of various other substances which are linked with it in its metabolism.

Calcium plays an important part in the mechanism of blood clotting. It is one of the chief constituents of bone. It helps to balance the H ion concentration of the body fluids and tissues. It is necessary to the neuromuscular apparatus and also has an effect upon the heart.

Hyperealcemia or an increased concentration of calcium in the blood serum causes nausea, diarrhea, drowsiness, loss of appetite, muscular flaccidity, coma, and eventually death.

Hypocalcemia causes increased neuromuscular irritability which may result in tetany: there may be produced rarefaction of bone as well.

From one to one and five-tenths grams of

calcium are required daily to maintain the calcium equilibrium of the body. There is no calcium in the red cells. It exists in the serum largely as a saturated solution of calcium phosphate. In the test tube we are unable to dissolve as much calcium phosphate as is normally held in the blood serum. Consequently, there are other factors involved than a mere matter of solution. If we add some protein to the solution, more calcium will be dissolved probably as calcium proteinate. This fraction plays little or no part in calcification as it is unavailable for the formation of calcium phosphate. Thus we can understand why in certain types of nephritis we have hypocalcemia without the appearance either of tetany or decalcification. In these cases most of the calcium which is lost is that attached to the protein molecule. In malnutrition when both the serum calcium and protein are lowered, similar effects may be noted. This may explain why there is no decalcification in many terminal cases of tuberculosis when there is a lowering of the serum calcium.

A third factor which tends to hold calcium in the serum is the parathyroid hormone. This is an active physiological agent and has a marked effect on calcification. It causes an increase in serum calcium by dissolving calcium from bone. If the usual sources of supply are cut off calcium must be obtained from bone while phosphorus may be had from bone, muscle, and various combinations with proteins, lecithins, and phospholipides.

According to Cantarow and others (1) calcium exists in the blood stream as ionized and un-ionized, diffusible and non-diffusible, and as free and combined calcium. Seventy to 75% of the calcium is diffusible through collodion membranes, Klander & Brown (20) found 15 to 25% of the calcium ionized. Snell and Haley (3) found that in pathological conditions the diffusible calcium varied as to the total calcium and so had little clinical significance. Most of my ideas on absorption and excretion of calcium were obtained from a paper by Peters (4).

Numerous factors influence the absorption of calcium from the alimentary tract.

1. Solubility of compound, calcium chlorid and calcium lactate are most soluble than the carbonate.

2. Alkalinization diminishes the absorption of calcium.

3. If there is a disturbance in the mechanism of fat digestion the calcium combines in the intestinal tract with fatty acids to form calcium soaps which are very insoluble. This may be a reason for the lowered serum calcium which has been found in jaun-

\*Read before the Jefferson County Medical Society



dice by Koechig (5) and Kirk and King (6), but denied by King and Stewart (7) who found it increased, and Snell and Greene (8) who found no significant change. With a lowered serum calcium one of the factors in clotting is disturbed.

4. Acids promote calcium absorption by forming more soluble salts.

5. The antirachitic vitamin D acts as a catalytic agent in increasing absorption of calcium from the alimentary tract.

In serum certain things tend to increase the amount of calcium present.

1. Raising the H ion content of the blood increases the solubility of calcium, thus tending to decalcify bone.

2. Lowering the H ion content has an opposite effect. Thus acid has the rather contrary effect of increasing absorption from the alimentary tract while at the same time increasing the solution of Ca salts from the bone.

3. Parathyroid extract increases the serum concentration by dissolving Ca from the bone. At the same time the phosphorus in the serum is decreased, there is increased excretion of both. It causes bone softening, muscular weakness and loss of muscle tone when given in large doses.

4. Hypoparathyroidism on the other hand causes a decrease in serum Ca with an increase in phosphorus, lessened excretion of both, muscular irritability and tetany.

5. The administration of vitamin D may push both the serum calcium and phosphorus to high levels. With it is associated increased calcification which may even effect tissues other than bone.

6. The administration of magnesium in the presence of an adequate amount of phosphorus tends to raise the calcium content of the blood and also promote the storing of calcium in the body. Dr. Barbour and I (9) have shown the former in a few experiments in man and the latter fact has been shown by Steenbock and Hart (10) in cattle, and by Dr. Carswell and myself (11) in both dogs and man.

Excretion is increased by:

1. Increased H ion concentration.

2. Increase in amount of parathyroid hormone.

3. Increased thyroid hormone. There has been shown an increased calcium output accompanied by rarefaction of bone which may be demonstrated by x-ray in hyperthyroidism. On the other hand hypothyroidism causes both increased calcium retention in the blood and an added deposition of calcium salts in the bone.

Thus we have several factors involved in the depositions of calcium.

1. Those which increase alimentary absorp-

tion of calcium such as vitamin D.

2. Those which permit the serum to hold calcium either in solution or in a high degree of concentration.

3. Those which cause a depression in solubility of serum calcium causing precipitation with subsequent deposition in bone.

Changes in blood calcium due to various diseases.

There has been a great deal of difference of opinion expressed by various writers as to the effects of various diseases on the serum calcium. I will quote the opinions expressed by various authors commenting on some of them. Davis (12) states that there is a hypocalcemia in tetany, acute cases having 4-6 mg. per 100 cc. and latent cases 7-8 mg. In rickets the calcium content is normal but the phosphorus is low, the product of calcium and phosphorus which should be about 35, being 30 or lower. This product is a very good means of measuring Ca-R deficiencies. In ten cases of osteomalacia which were studied in China, seven had tetany. The serum calcium in these cases ranged from 5.2 to 7.4 mg. per 100 cc. It is also found in certain types of renal disease when there is a fall in calcium accompanied by an increase in phosphorus. Henry and Ebeling (13) found Ca and phosphorus lowered in tense, agitated depressed states consistently.

Benedict and Turner (14) found no significant change in polycythemia vera in nine cases. This result is contrary to that obtained by others. Glaser (15) found that the Ca concentration of the blood decreased on calming patient an average of 2.16 mg. and that excitement increased serum calcium. Koechig (5) found hypocalcemia in nephritis, colitis, pellagra, jaundice, osteomalacia and tetany. Hypercalcemia was found in Paget's disease and pathological fractures. Brown and Hunter (16) found a considerable portion of all cases of asthma, hay fever and eczema had Ca deficiency. Crip and McElroy (17) in 167 cases of asthma and allied conditions could not substantiate this result nor could Klander and Brown (2). In a few advanced cases of arthritis deformans it has been found high by Mark (18). Nachlas (9) found it within normal limits in osteoarthritis in nineteen cases. Pemberton (20) found it low in ten cases of arthritis 7.1 to 7.3. Peterson (21) found an increase in Ca-P product in the healing stage and a decrease when there was non-union (below 30), between 30-35 little healing, 30-40 active healing. Ravdin and Morrison (22) found low calcium and high phosphorus with retarded union in experimental fractures in dogs after parathyroidectomy. Horwitz (23) found serum calcium high in acute gout and normal in chronic gout. It was high in five

out of fourteen cases of arthritis deformans.

Waldorp and Trelles (24) found calcium reduced in twenty cases of hyperthyroidism and in four cases of acromegaly. Pincussen (25) and others found the calcium magnesium ratio lowered in chloroform anesthesia. Emerson (26) found an increase of 18-20% in serum calcium during ether anesthesia or during asphyxia, but following anesthesia or hyperventilation there was a slight decrease. Shock had no effect upon Ca content. Lemann (27) found no significant changes in leprosy. Durham and Outland (28) showed a lowered serum Ca or phosphorus or both in Perthes' disease. Gunther and Greenberg (29) found lowered Ca in seven out of fifteen cases of malignant disease. Greisheimer (30) has found that the serum Ca diminishes with age.

Dolgopol (31) has done some very interesting work on calcium in tuberculous. She found the Ca content increased in moderately advanced cases of tuberculosis but decreased in far advanced cases, eighty-five per cent of those with Ca level below 9.2 dying within three months, while those having a content of 10.1 or more showed only six per cent mortality. This work has been contradicted by American authors. Brockbank (32) states that arrested cases show high Ca content. This may be due to the fact that they usually have a relatively high Ca intake. Laufer (33) believes there is a terminal drop in calcium which occurs in all types of malnutrition and is the result of general demineralization.

From the above quoted results which are fairly representative of literature on serum calcium it can be seen that there are a few conditions in which the opinions agree that there is a significant change in the serum calcium. There are also many others in which there is a marked difference of opinion.

The technique of serum calcium determination is not particularly easy. Slight mistakes may cause some of the calcium to be redissolved after its precipitation and then discarded in the filtrate. This may be a common source of error. Other factors which may play a part in the variability of results are diet and the mental state of the patient.

#### CONCLUSIONS

The following conditions cause a decrease in serum content of the blood: tetany, osteomalacia, pellagra, certain types of nephritis, colitis, fracture with non-union, hyperthyroidism, acromegaly, Perthes' disease, malnutrition and sometimes in terminal stages of such wasting diseases as malignancies and tuberculosis.

It is increased in acute gout, Paget's disease, pathological fractures, tumors of the parathyroid gland, hyperparathyroidism, and hypothyroidism.

There is still much to be learned about calcium, about its relationship to other constituents of the blood and the effects which they have upon each other, about the effects which certain diseases have upon its metabolism, and also the therapeutic effects of calcium administration.

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#### DISCUSSION

**G. A. Hendon:** I recently read Cantarow's book on the subject of calcium and I was very much amazed at the wide range of therapeutic applications that it covered. Through the co-operation of Doctor Allen I have been able to elicit some clinical data that might be of more or less interest, and those conditions were in connection with abdominal lesions, particularly peritonitis, and all conditions following acute intestinal obstruction. We were able to find in all these cases a lowered amount of calcium content, about 7 mg. By the intravenous administration by the continuous method, we were able to raise the calcium content to any proportion we desired. We, however, would never



raise it above 15 mg. Those cases where we had a prompt rise in calcium, after its intravenous administration, showed a marked improvement as soon as the calcium ratio began to rise.

Another very important consideration is the dosage. We have been in the habit of giving too small doses. The dose recommended in Cantarow's book of the gluconate calcium is 60 grains or about 4 grams, at a dose. That can be repeated three or four times a day. It is probably more accurate to base the dosage, however, on the weight of the patient, usually about 80 mgs. to each kilogram of weight, which would give you about 4 grams to the dose, and four doses a day, 240 grains.

I was very much impressed with its effect on acute hepatic conditions, particularly jaundice and degenerative changes in the liver. We tried one case, with Doctor McConnell, that showed certain evidences of acute yellow atrophy. After this patient was given a considerable amount of gluconate of calcium, combined with glucose, she made a rapid recovery. I believe that it is very important addition to our therapeutic knowledge, to realize the vast range of conditions that calcium therapy will cover, being particularly valuable in hepatic diseases.

I find, after reading Cantarow's book, that it is of great value in almost all convulsive states. Observation shows that in all these cases there is a repression of calcium; by the gradual raising of calcium content of the blood the symptoms are overcome. It is well known, of course, that in all cases of tetany, from whatever cause, there is present a lowered calcium content.

Calcium salts can be given orally, intra-muscularly or intra-venously. We prefer the continuous intra-venous method.

**John R. Wathen:** I think this is one of the most important subjects brought before the Society for some time, especially interesting to us surgeons, who must appreciate the value of calcium. My own discussion will be limited to my personal experience and not to any research work found in the literature. I have had a number of cases following goitre operations which developed tetany after operation, and this is based on about thirty years' experience in goitre work. I believe that more surgeons are seeing this condition than formerly for the reason that we are becoming bolder and taking out more of the thyroid gland, thus cutting off some of the circulation in the para-thyroids, and allowing a temporary condition of tetany to develop. Under proper treatment this condition can be cured in a few weeks, or months, and I prefer to use large quantities of lactate of calcium by stomach, watch the effect of this drug, both by laboratory and clinical observation. I also add to this thyroid extract in small quantities and Vitamin D. Dr. Winter claims to have had poor results with Collip's serum, called

Para-Thor-Mone and I can understand why and am passing around a small box obtained from one of our leading druggists, in which you will note that the expiration date is February, 1933, but the color is dark urine color and absolutely worthless. It took me some time to discover this and I now order by telephone direct to Lilly & Compnay, Indianapolis, for fresh preparations. This probably accounts for Doctor Winter's poor results with Collip's serum. Collip's serum, like insulin, should be kept in a refrigerator and not exposed to heat over long periods, as it is not a stable product under the circumstances.

Doctor Morris Flexner states that the X-ray does not affect the parathyroid glands as much as the thyroid, but my observation at operation is that the contrary is true. In Germany they have removed all four para-thyroids, but left the thyroid gland and no tetany has developed, proving that the thyroid gland also controls the calcium as well as the parathyroids.

Doctor Simpson makes the statement that we give this as an arbitrary dose for so many months. I did not say that. In the first place, the patients themselves can tell when they get over tetany. It is very desirable, as soon as they get enough, to discontinue treatment. We also have the laboratory check. I have never seen it above 15. The patient can see the difference. If they leave off the calcium for three or four days, they will begin to take it again.

**Virgil E. Simpson:** I think the essayist is to be congratulated on his courage in making an effort to prepare a paper of this sort, to say nothing of the courage required to face the possibility of empty seats. The attendance tonight proves the Jefferson County Medical Society is awakening to the tremendous interest that is shown in physiological chemistry by the profession at large.

I came primarily to learn something about magnesium metabolism. I have been somewhat interested in it in a rather desultory and casual fashion, but have not learned a great deal about it. I thought perhaps the essayist would be able to enlighten us and am sorry his courage failed. He has reviewed the literature very thoroughly concerning calcium and it has required a lot of reading to present material the way it was presented.

From a practical standpoint the deductions that can be made from the work of the laboratory man are now rather far reaching. It was the conception that tuberculosis represented calcium deficiency which gave rise to the milk diet and other forms of calcium administration in that disease.

The next impetus that was given to the study of calcium metabolism came about through mistakes of the surgeons. That represents their contribution to the knowledge of calcium meta-

bolism. They laid the foundation for the interest in it by unwittingly removing the para-thyroid glands which led us to consider tetany as a clinical entity. To say that there is such a thing as tetany is only beginning what one should say, and while it is true that practically all clinical forms of tetany are associated with deficiency of calcium, temporarily at least, it is far from being true that all forms of tetany depend upon the same causative factor, or that all forms require the same sort of management. In the removal of the para-thyroid gland the ability to utilize calcium regardless of the amount put into the body through diet or that given as a drug is largely removed, and to give calcium is nearly as useless as the filling of a patient's system with iodine when there is no thyroid in existence. The cretin does not need iodine; he needs thyroid substance. The para-thyroid deficiency incident to removal will be little helped with calcium; he has lost his power of utilization of calcium and needs para-thyroid. Quite a different story is that of a pregnant woman for example—she shows a deficiency of blood calcium and may develop a very striking clinical picture which is too often designated as puerperal eclampsia, and treated as such. It not infrequently is tetany, but is a tetany incident to the unusual drain or demand of two bodies trying to subsist on one diet intake of calcium. Likewise it is also true that certain types of gastro-intestinal diseases may cause tetany. In a deficiency of hydrochloric acid, or its failure to reach the bowel because of pyloric obstruction, tetany may develop, but there is no fault at all with the para-thyroid, therefore, chloride of calcium or administration of para-thyroid substances is futile. Such a tetany can be cured by a gastro-enterostomy.

Do not be misled by the statement of Doctor Wathen in regard to insulin, in comparing the grade of Collip's hormone. He stated insulin is kept on ice. It is not and should not be. It is not a substance which deteriorates at room temperature. I have been particularly interested in the question of blood calcium in connection with the diabetic. It is strange that in the diabetic state blood calcium generally is altered. Just the explanation for this I have been unable to satisfy myself, either by some sort of individual solution or by consulting the literature; but the fact remains that perhaps a majority of diabetics show some alteration in the chemistry so far as calcium content is concerned. Finally, it is of interest, I think, from the standpoint of the clinician to bear in mind something in regard to the administration of calcium to relieve the so-called deficiency; the statement that 10 grains or 100 grains, or 1000 grains of calcium should be given for a definite period is an inaccurate assumption. Who knows how long one should give calcium in any individual case? It is an individual problem and

should be treated as such; it cannot be solved by stating that one should give 100 grains of calcium for three months. One might just as sensibly say that a wound must be closed by four sutures and that their introduction should take thirteen minutes.

Calcium deficiency, if treated with calcium as a drug, must be treated on the basis of an individual problem, as it presents itself, due to this, or that, or the other condition, not by a general dictum. On the other hand, it is also important to remember that dosage is also a rather arbitrary matter; it is not a question so much as to how much calcium should be put into the blood stream, but rather how much of the dosage given is the patient utilizing. It does no good to give 100 grains to an individual patient if that patient is not utilizing the calcium. It merely becomes a hyperealcemia, exactly as the diabetic when given large doses of glucose shows a hyperglycemia.

The neuromuscular irritability of tetany depends largely upon the relation of calcium and magnesium to sodium and potassium. The symptoms of tetany are, likewise, as dependent on alkalosis as upon calcium deficiency in the blood. This explains why tetany may not obtain in a patient whose blood calcium is as low as 6 and may develop in another whose blood calcium is as high as 8.

**Morris Flexner:** Just about a year ago I became "calcium minded." I put a technician in my laboratory just to do blood calcium, particularly with one thing in view. I wanted to investigate the cases of hyperthyroidism treated with X-ray to see what effect X-ray had on the para-thyroid; also to investigate a group of asthenics, which I thought possibly had a calcium angle. I was disappointed in the results. In all those cases, and we ran fifty, blood calcium ran 9.5 to 10.5 mgs. per 100 cc. serum.

Aub, of Boston, reports the use of calcium chloride in acute gall bladder attacks. He stated calcium chloride intravenously would give much better and quicker pain relief than morphine. I wonder if anyone here tonight has found this to be true? He also mentioned its use in renal colic.

Along that line, I might also mention some results which Alexander in St. Louis found with bronchial asthma. I know of one particular case of a man who was getting 300 minims of adrenalin a day with  $\frac{1}{2}$  gr. of morphine. He was put on calcium and ammonium chloride, more attention being paid to ammonium chloride. After three or four days he was able to get down to 20 or 30 minims of adrenalin. He was never cured of bronchial asthma, but relieved immensely. He was also on a ketogenic diet, which probably assisted in maintaining his calcium at a high level.

**H. M. Rubel:** I came down here this evening



to see if I could get some additional information from Dr. Winter's paper on the convulsive seizures we have so commonly designated as eclampsia. What causes eclampsia? There have been volumes written every year and we still do not know what causes the eclamptic state. If you take time to go through Williams' or DeLee's Obstetrics, you will find a list of causes as long as your arm and we still do not know definitely what causes it. We know one thing for sure, it happens only in pregnant women. What causes eclampsia?

The theories of the pathogenesis are legion and cannot be enumerated at this time. It is significant to say that all theories proposed fall into one or another general group. These theories are that eclampsia may be the result of intoxication of the mother with the products of fetal metabolism; of the entrance of the fetal elements into the maternal circulation; of anaphylactic reaction; the disturbance of maternal metabolism; of decomposition products of the placenta or endocrine disturbances, etc., etc. McQuarrie, in 1922, showed that in eclampsias there is a greater proportion of incompatibilities between the maternal and fetal blood types than in normal pregnancies, and expressed the opinion that eclampsia was due to agglutinative changes caused by the incompatible fetal blood gaining entrance into the maternal circulation. This is still unproved.

Mitchell, in 1910, expounded the theory that calcium deficiency is the cause of eclampsia. To overcome this deficiency he fed his patients calcium salts. So, as at the present time, where we liken the fetus unto a growing parasite abstracting glycogen from the liver and thereby causing a toxic condition of this organ which can only be detoxicated by the addition of large quantities of glucose, a similar theory has been advanced that it is due to the abstraction by the fetus of the calcium which should normally unite with the neutral fat in the liver cells to form lipoids, etc.

Calcium figures for normal pregnancies vary somewhat with different groups of investigators. One author will quote 10.5 to 12 milligrams per 100 cubic centimeters of serum, while another may quote lower readings. Some even report no appreciable changes in the blood calcium during pregnancy. The literature of the blood calcium in eclampsia is most meagre, and still an unsettled matter. One investigator reports that while his figures for calcium in eclamptics were somewhat lower than those of normal pregnancy, the difference was negligible. In prenatal work it would be advisable to inquire into any history of delayed dentition, or walking, or any osseous changes, or rachitis.

We know by routine examination of blood having been made in a number of clinics, that blood calcium changes are not constant. When there is a possibility of nephritis, you get blood

changes. You may have an increased urea, you may have an increased N. P. N., and occasionally an unbalanced calcium content. It would be wise for every woman who is going to have a baby to be examined at times for the calcium content of the blood, to see, over a period of time, if any decided change is noticed, and if your calcium content is running 10.5 to 12 mgm., which we take as normal, any decrease could be supplied by the various medicines on the market.

You may use calcium gluconate in tablet. I have been in the habit of giving tablets, or you can give intravenously, if you wish, just to see what definite action this causes. Some men give para-thyroid extract. I have never had any occasion to give this.

So far, I would like to know something definite to do for these cases. One of the best forms of treatment, as an adjuvant, that we now have, is the intravenous use of glucose.

After a patient has been given her routine injection of magnesium sulphate solution deep into the gluteal area, 500 c. c. of a 20% solution of glucose is now given intravenously. If patient becomes quiescent, the convulsive seizures having been controlled, you may introduce the glucose solution by the method advocated by Dr. G. A. Hendon, and known as venoclysis. In this way glucose solution is introduced, drop by drop, over a long period. The amount of calcium to be taken, over how long a period, what definite results may be expected, is still problematical. No doubt, the future has much in store for all of us in the quest of a remedy for the prevention and abolition of all tetanic and convulsive seizures. I enjoyed Dr. Winter's paper very much indeed, as it takes all of us into new realms of research out of which much good is to accrue.

**W. E. Gardner:** I was very much interested in Dr. Winter's paper and especially his statement that the mental state of the patient may affect the calcium content of the blood, and if this be true there must be a good deal of variation within what might be termed rather wide normal limits, without necessarily indicating a faulty calcium metabolism extending over any appreciable length of time.

At the meeting of the Southern Medical Association in Asheville, N. C., three years ago, we had, as guest of the Neurological Section, Dr. Walter Timme of New York City, who in discussing some behavior disorders in children of the adolescent age, made the statement that x-ray studies of the pineal gland were frequently of value in determining a faulty calcium utilization. He made the point that, ordinarily, the pineal gland does not show a shadow in normal individuals before twenty or thirty years of age, but that in some children who suffer from marked behavior disorders it was found that the pineal shadow could be demonstrated as early

as fourteen or fifteen, indicating a faulty calcium utilization.

The suggestion has been made that x-ray studies might be of value in many suspected cases of more or less chronic or prolonged types of faulty calcium utilization, if the long bones, or other portions of the skeleton, were subjected to more frequently x-ray examinations. Dr. Timme believed that administration of parathormone in his cases showing behavior disorders had been of definite value, especially in those had an early calcification of the pineal gland.

I have frequently had blood calcium studies made in children of this type most of which have been within normal limits, and an effort to demonstrate an early calcification of the pineal gland has been somewhat disappointing. I have however, given para-hormone experimentally in a limited number of cases with some favorable results. As Dr. Simpson has stated, the amount of calcium found in the blood at any given time does not indicate the degree of calcium utilization and in the absence of x-ray studies, I know of no method of determining this except by clinical results. I should be glad to know what has been the experience of some of our x-ray men regarding the matter.

**C. D. Enfield:** My impression is that the time of calcification of the pineal is variable and I do not know anything about the angle brought up by Doctor Gardner.

**James E. Winter,** (in closing): I must admit that my paper is based on the literature almost entirely. I do know something about magnesium metabolism as I worked with it in experimental animals for four or five years, and the effects of magnesium and calcium in a lot of ways are similar. If we give either calcium or magnesium into the blood stream in an animal or give it subcutaneously in large doses we get anesthesia, we get muscular relaxation, we get a fall in temperature and, if the concentration in the blood stream becomes high enough, death will result. If we had a reasonable margin of safety between the doses necessary to give anesthesia and the amount which it takes to produce death, we would have a wonderful anesthetic in either magnesium or calcium. Unfortunately the margin is slim, much too slim, for use in that way. In giving either calcium or magnesium, and both have been given in eclampsia, the question is whether we are curing calcium deficiency always, or whether we are producing the usual effect of administration in raising the calcium or magnesium level to the point which will produce muscular relaxation. With either of these two we get an extremely marked muscular relation. I do not know of anything that will produce a more marked relaxation. The length of time for which the anesthetic lasts is not particularly long, an hour or two, and the recovery is very prompt. A rather peculiar thing

is that, if we give a large dose of calcium intravenously, calcium chlorate enough to kill an animal, and wait until the animal is almost in its last gasp, and then inject magnesium chloride, which has a somewhat similar action, the animal revives and makes a very dramatic recovery. This was first noticed by Meltzer and Auer, in 1908, and is one of the stock pharmacological class experiments. It is well to remember, however, that magnesium chloride does counteract the effect of calcium in over-doses, and if calcium is given often enough, sometime, sooner or later, it will be given in too large doses. It is well to remember that the magnesium will act as an antidote.

The opinion in the literature on changes of calcium metabolism in eclampsia is so varied that I did not attempt to sum it up: it is simply contradictory; I could not draw any conclusion from it.

## SYMPOSIUM ON INTRAVASCULAR SURGICAL COMPLICATIONS

### ARTERIAL CONDITIONS OF SURGICAL IMPORTANCE\*

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Some very interesting features are presented by the blood vessels. One of the most striking is the resistance of the intima of both arteries and veins to irritants. Substances can be injected into the vessels without irritation which cause severe reactions when placed in the subcutaneous tissues.

It is a well known fact that the artery being strong and elastic often escapes serious injury in gun-shot and stab wounds. The transportation of foreign substances within the blood vessels has been studied experimentally with reference to embolism and thrombosis. Clinically, too, some bizarre observations are reported. A case mentioned by Col. Robey in an address at Rimanecourt, 1918, as occurring in a soldier in the world war, is very interesting and unique. A fragment of shrapnel was lodged in the liver. While the surgeon was attempting to remove it, operating under the fluoroscope, the foreign body was found to move upward into the chest, evidently, in the vena cava, then rested in the right auricle of the heart. While under observation and the consideration of the possibility of its operative removal, it became displaced and carried to the right ventricle. Later it was transferred to the pulmonary artery. The man died from another condition, and it was found at this location at necropsy. The interesting features in this case were the small amount of

\*Read before the Jefferson County Medical Society.



hemorrhage from a wound of the vena cava and the transportation of a considerable fragment in the vessels of the heart.

A similar and even more spectacular case was shown in Philadelphia by Dr. J. H. Jopson to the members of the College of Surgeons. This patient received a penetrating but not perforating gun-shot wound of the upper portion of the left chest. Skiagram of the chest failed to reveal any foreign body. Subsequently, this bullet was found lodged in the popliteal artery of the leg. The bullet either entered the heart or the aorta without a serious hemorrhage, and even caused little inconvenience in the artery where it later became lodged and remained for some time after the accident.

The heart is well known to stand injury well and to be prompt in repair of damage to its structure. Murphy, Mates, Carrel and others proved years ago that arteries could be sutured safely without blocking the lumen.

Wounds of arteries occur with such frequency and their management is so well understood that such injuries only need to be mentioned in this connection. The method of treatment usually employed consists in a ligature of both bleeding ends. In the case of injury of the larger vessels it may be necessary to resort to direct arterial suture to obtain a restoration of the circulation.

Cases of injury to the large vessels with unusual features are sometimes observed. During my service at the City Hospital years ago, under Dr. Horace Grant, a man presented with a gun-shot wound of the external iliac artery, just above Poupart's ligament, in which serious bleeding was prevented by the tension on the fascia and muscles overlying the vessel. The injury, some hours after its occurrence, was treated by ligation of the artery above and below. False aneurysm following a wound of a large artery may also result from a stab or gun-shot wound which only partially severs the tunics. The traumatic aneurysm may develop at once or later during apparent convalescence, as I noted in a few instances. A most interesting case of false aneurysm of the profunda femoris followed an injury from the knife used by a veneer worker at his work table. The wound was treated in a hospital with control of hemorrhage by the usual method. His convalescence progressed well, and he left the hospital about ten days later. Some swelling and tenderness persisted and he returned to the hospital. At this time I was called into consultation and made the diagnosis of traumatic aneurysm. Following the usual operative treatment, he made satisfactory recovery. In this case the attendant was misled as to the gravity, because of small primary hemorrhage. A bleeding ves-

sel should be brought under the direct view of the surgeon. The motto of Dr. A. M. Cartledge was "Look the bleeding vessel in the face."

When a large artery and its accompanying vein are injured, both should be ligated if seen primarily. If an aneurysmal varix or a varicose aneurysm results, as sometimes occurs, the best method of treatment is to tie both vessels above and below, and excise the aneurysm.

It is not my purpose to consider in this connection a study of aneurysm, which is in itself a subject for special study. You are all familiar with earlier literature upon this subject, as well as the more recent and original work of Matas.

The artery may be injured in fracture or dislocation with the development of a false aneurysm. The writer reported to the Southern Surgical Association in 1927 a case of rupture of the brachial artery from a dislocation with ischemia of the forearm, swelling, great pain and complete absence of pulse at the wrist. When seen three hours later an arteriorrhaphy restored the circulation and the radial pulse. No tight dressings were applied. As a result of the prolonged lack of blood in the forearm a Volkmann's contraction (atrophic myositis) resulted, although the arm was saved.

Endarteritis, too, can only receive passing mention because of its importance in the development of arterial block and gangrene of the extremity, which results. This condition and the concomitant cardiac disease are proper subjects for consideration by the internist. The study should interest the surgeon also, because of the close relationship of these conditions to embolic block of the larger as well as the smaller arteries. His interest is also aroused because certain conditions resulting from cardiac valvular lesions and endarteritis produce symptoms that resemble surgical lesions of the upper abdomen, and require a careful study to make accurate differentiation possible. These are notably coronary block, pulmonary thrombosis and pulmonary collapse, so called.

The following case seen with Dr. W. O. Humphrey at 6 P. M. on July 25, 1928, illustrates this point: At 5:00 P. M., after gargling his throat for some irritation, he became nauseated and very uncomfortable. He attempted to produce emesis and vomited. Finally some blood was observed in the vomitus. He also complained of severe pain in the epigastrium.

Temporary relief was obtained by a dose of morphia. Dr. Humphrey was called back within a short time and also asked me to return. When I saw him he was pale, with moist, cool skin, and in evident distress. He

had slight dyspnea and his pulse was slow, regular and rather full. The abdomen was somewhat tense in the upper portion and some tenderness was elicited, but there was no board-like rigidity or sufficient evidence to justify the diagnosis of a ruptured peptic ulcer.

The man was in no condition for transportation, nor was he considered a good surgical risk at this time. He had another attack of hematemesis in considerable quantity, and we saw him again. Rest and expectant treatment were continued. The next morning at 8:00 he was not in such extreme distress. Hospitalization was suggested with further observation and he was removed to the Norton Infirmary where he was seen in the late afternoon by Dr. Lucas, who agreed with Dr. Humphrey and myself that surgical intervention was not indicated, although a positive diagnosis was not made. The history suggested peptic ulcer more than did the physical findings.

At this time numerous rales were heard over the chest, and, apparently, pulmonary edema was present. Under a dose of atropine this cleared up considerably. Dr. Virgil Simpson joined us in consultation about one hour later, and after close examination, expressed the opinion that there was no surgical lesion in the abdomen, but that all the pathology was in the chest. At 10:00 P. M. we made diagnosis of "Massive Pulmonary Infarct," with which all agreed. Death occurred at 4:30 A. M.

One of the most distinctive evidences of sudden arterial bloc is severe and intense pain. There is also an interference with the nervous mechanism as well. The part becomes cold and blanched. Such symptoms coming on suddenly are indicative of embolus. In my early practice a lady of 60 years had embolic bloc of both femorals, with symptoms described above. Unfortunately, at that time embolectomy had never been suggested, nor indeed had arterial suture been considered.

More recently a case of gradual bloc of the left brachial artery came under observation. This evidently began as a partial obstruction with lividity, some pain, some change in temperature, partially relieved by posture, but going on to complete obstruction.

The most important arterial condition which demands surgery, next to severe active hemorrhage, is arterial bloc due to embolus and thrombus. For many years past both experimental and clinical studies of these conditions have been made with the hope of preventing gangrene in the extremities, which occurred so frequently from complete obstruction of the lumen of the larger vessels by a floating clot. In rare instances restora-

tion of the circulation distal to a partial obstruction may occur. When complete occlusion takes place such result is extremely unlikely. Extension of the clot into the smaller vessels below the point of lodgment is of great importance in the determination of gangrene.

Many years ago efforts were made to prevent gangrene following bloc of the larger arteries of the extremities, but these efforts met with universal failure.

Sabanejew in 1895 first attempted to remove the obstructing clot by arteriotomy. The effort was unsuccessful and the patient succumbed to amputation.

Trendelenburg in 1908 recognized the possibility of operative relief for pulmonary embolism, and suggested a method of procedure for the purpose. Time does not permit a mention of all the men who have contributed to this department of surgery. Neither the numerous failures nor the many difficulties in this field, prevented repeated efforts to accomplish success. The concept of this condition and the causative factors leading to its occurrence has been greatly widened within the past century.

The Scandinavian surgeons have especially developed this field. The experimental work of Panum must not be forgotten, since it next to the studies of Virchow, has done most to develop the knowledge of embolism, and is classical to this time. Dr. R. Matas pays a high tribute to these men in an editorial in the *American Journal of Surgery* in June 1930.

The most outstanding work in this connection is that of Prof. Einar Key of Stockholm. His report of 216 embolectomies for the removal of clots in the main arteries includes 11 for obstruction of the abdominal aorta up to 1929. Of the 216 cases 146 or 68 per cent were reported by Scandinavian surgeons. Key's personal contribution was 15 cases with 8 recoveries, one of which was a successful embolectomy of the aorta. From 1895 to 1911, 11 embolectomies were performed, and only one of these recovered. These facts emphasize the great work done in Sweden and Norway. Matas says, "The success of the Scandinavian methods is not solely due to their excellent technique which is practically that laid down by Carrell for arteriorrhaphy with the free use of sodium citrate as an anti-coagulant, but it is in their alertness in diagnosis and their promptness to act on the diagnosis that they excel."

Up to 1927 only 20 embolectomies had been performed in the United States, Canada and Great Britain, according to Pemberton. This advance in arteriotomy of the larger vessels of the trunk and extremities must not be permitted to overshadow the work done for



the relief of pulmonary embolism.

Kirshner in 1924 was the first to successfully perform Trendelenburg's operation. This operation was performed upon a woman of 38, suffering from pulmonary embolism. Since that time a total of 7 recoveries from this exceedingly grave condition have been obtained, according to A. W. Meyer, Berlin, who had 2 successes in 3 cases. Meyer has developed a rapid and efficient technic which can be completed with the utmost rapidity. Speed, calmness, and dexterity are essential to success in this field of endeavor.

Two most interesting cases of embolism of the abdominal aorta have come under my observation. One was the direct result of traumatism, the other developed spontaneously in a case of cardiac disease.

The first patient was admitted to the Norton Infirmary in the service of Dr. A. C. McCarthy, following an abdominal injury. He had been struck in the abdomen by a piece of timber with considerable force, and was in marked shock. This condition improved under usual treatment in six hours. He complained of some pain in both lower extremities, which became ischemic, cold and spastic with loss of tactile sensation and motion. Owing to the rarity of the condition and the neurological picture, Dr. R. Glenn Spurling was called in and made the following notations:

Postive Findings. Subjective: 1. Blow upon the abdomen at twelve o'clock (noon) October 8, 1928. 2. Immediate abdominal pain followed by pain in the legs, particularly the left. 3. Both legs numb with severe pain in each. 4. Patient unable to move the right leg, and the left was decidedly weak. 5. Immediate severe shock which gradually subsided under treatment.

Objective. 1. Line of anesthesia to all forms of sensation about on a level with the crest of the ilium (twelfth dorsal segment). 2. Left leg spastic but slightly mobile; right leg immobile and spastic. 3. Tendon reflexes absent, plantar reflex absent. 4. Left leg cold, white and ischemic; right leg warmer but not normal. No pulsation could be detected in either leg at the femoral triangle, over the popliteals or tibials. 5. Lumbar puncture showed clear fluid with normal pressure readings; negative Queckenstedt.

Impression. Injury to the abdominal aorta with ischemic paralysis of both legs. It is believed that damage to the spinal cord can be excluded.

The writer was called in consultation at 10.25 P. M. (same day), and from the foregoing findings concluded that the patient had suffered a severe injury of the abdominal aorta and had an embolus at the bifurcation as a result of the traumatism. Doubt was

expressed to the family as to the possibility of successfully restoring the circulation in the extremities, but operation was considered the only hope that could be offered the patient.

The particularly interesting features in this case are: The unusual nature of the injury, the manner in which the embolus developed, and the practically complete occlusion of both iliacs simultaneously, with symptoms strongly resembling those resulting from pressure injury of the spinal cord.

The patient was admitted with a pulse rate of 130, temperature 94.4 degrees F., respiration 24, blood pressure 138/80. At 1:00 P. M. the blood-pressure had risen to 152/100. This very unusual finding was probably the result of the usual shock medication and all blood being withheld from the extremities and the tension on the vessels thereby increased. The mentality of the patient was clear, and all reflexes in the lower extremities absent. Subsequently the temperature rose to about normal and the pulse rate improved, being 120 just prior to operation.

Blood Examination. Hemoglobin 78 per cent, erythrocytes 3,600,000, leucocytes 18,650; polymorphonuclears 92 per cent, lymphocytes 8 per cent. Urinalysis: Urine dark amber in color, cloudy, reaction acid, specific gravity 1.016; albumin three-plus, sugar, acetone and diacetic acid negative; a few erythrocytes and pus cells in each high power field.

No minute physical examination could be made because of the desperate condition of the patient. Arterio-sclerosis was marked throughout. The head, neck and thorax were essentially negative. The abdomen showed a contusion over the right side of the epigastrium, with general tenderness and rigidity. The other findings were as reported by Dr. Spurling.

Abdominal section was performed under gas-oxygen anesthesia at 11:40 P. M., or twelve hours after the injury. The abdominal wall showed a small clot on the right side of the mid-line above the umbilicus. A small amount of free blood was found in the cavity. There was a rent in the lesser mesentery, some ecchymosis presented over the abdominal aorta near the celiac axis, and the vessel was evidently contused at that point. The external coat was not torn, but there was a rent in the posterior peritoneum overlying it which was not cut through. There was no immediate injury to any other viscus, but the peritoneum over the gall-bladder was slightly torn from the liver. The lower part of the aorta near its bifurcation was occluded; no pulsation was detected in either iliac and an embolus was found at the division. On gentle manipulation of the embolus

through the vessel wall slight pulsation could be elicited below the bifurcation for a brief time and it then ceased, showing that the clot had been pushed downward into the two vessels, thus blocking the flow.

The aorta was opened just above the bifurcation, while it was held upward by means of the finger. Several plaques of intima which were unattached and obstructing the vessel were removed, and the clots surrounding them were also dislodged. The arterial wall was sutured with fine silk, a small amount of muscle placed over the suture line and the sheath coapted over it. The posterior peritoneum was closed and the abdominal wall sutured in the usual manner.

The patient left the operating table in fair condition with a pulse of 122 which gradually increased in frequency. He rallied somewhat, became conscious and the temperature of the extremities slightly increased, but the circulation was never fully restored. There was no great difficulty in controlling hemorrhage and the operative steps were rather simple. The patient died October 9, at 4:00 P. M.

In reviewing recent literature on embolism and embolectomy, no case similar to the foregoing could be found. The actual cause of obstruction to the vessel was an embolus consisting of portions of plaques which were torn from the intima of the aorta by the force of the injury; these were carried to the bifurcation and there occluded the vessel, thus blocking the flow. These plaques were flat with irregular edges, calcified, and measured about 2.5 cm. in length. As a result of the presence of these bodies slight thrombus formation had occurred immediately surrounding them.

The symptoms resulting from the presence of these emboli were similar to those described in cases of non-traumatic embolism. Special attention should be called to the spasticity which was first most marked in the left leg and thigh and subsequently developed in the right leg and thigh. The muscles became very rigid, so that the condition closely resembled rigor mortis. This rigidity appeared to result from sudden and complete deprivation of the nerves and muscles of their blood supply.

Undoubtedly the failure to restore the circulation in this case was due, to great extent, to the time which elapsed between the injury and the operation. The greater portion of this period was spent in efforts to overcome the shock.

The abdominal route was employed in this case because of the possibility of serious intra-abdominal lesions in addition to the vascular disturbance. It appears, however, from our later findings that opening the

femoral or iliac artery extraperitoneally would not have resulted in removal of the emboli, which were too large to have readily passed the bifurcation. The latter method has been suggested by Lumbard and Pemberton for dealing with emboli at the bifurcation of the aorta. The external iliac or femoral artery is opened on both sides of the lesion, the vessel is clamped below the opening, the embolus is dislodged by passing a flexible probe into the proximal portion, and the force of the blood stream washes away the thrombi. This method has the advantage of requiring an incision into the artery on each side, while the abdominal route requires only one incision and suture of the aorta at one point.

Dr. Morris Flexner saw the second patient soon after symptoms presented, and made a diagnosis of embolic bloc of the abdominal aorta. This opinion was confirmed by Dr. Porine, and by myself after his prompt admission to the Kentucky Baptist Hospital. I found a man, aged 52 years, suffering from cardiac disease, who had been suddenly seized with excruciating pain in both lower extremities which were pale, cold and without pulsation. The patient was conscious, but in great shock and was unable to move his limbs. Sensation was lost. Embolectomy was performed at once, and the patient rallied; but death followed within 24 hours. The results in these two cases, while discouraging have taught us something as to operative details as a result of arteriotomy.

In my first case the possibility of additional injury to the abdominal viscera decided in favor of the abdominal route. In the second case the suggestion of Pemberton to open the femoral under local anesthesia was followed. Each femoral was opened and found to be collapsed. The removal of the clot was not successful, and only slight bleeding occurred.

An abdominal incision was then made, and after the posterior peritoneum was incised with its fascia the artery was lifted on the left fore-finger, and incised longitudinally. The clots and fragments of intima were removed and the flow of blood started. The coats were sutured with silk and the fascia and peritoneum closed over the arterial wound. There was no bleeding after the arterial suture.

The operative steps necessary to remove the obstruction from the aorta are best conducted through an abdominal incision. There are several reasons for reaching this conclusion. By actual inspection and digital examination the location and extent of the clot, as well as the vessels involved, can be determined. The clots may plug each common iliac and femoral and each internal



iliac. All of these vessels must be cleared. Removal of the clots may be accomplished by breaking them loose with a probe, by milking them to the wound, and extracting them by a small scoop or by long endoscopic forceps. The best method is the use of a suction apparatus (E. H. Pool), aided by manual manipulation. All efforts should be gentle and rapidly executed. Where it is difficult to clear the distal vessels, a secondary opening permits through and through irrigation with solution of sodium citrate.

The limbs should be kept warm and elevated somewhat after the procedure is completed. To prevent coagulation in the operative field or elsewhere, stimulants to the circulation should be administered.

### INTRA-VASCULAR COMPLICATIONS IN SURGERY: THE VENOUS COM- PLICATIONS\*

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Trends in medical thought, often quite definite and quite general, have long been the fashion. On a smaller scale some active spirit among us now and again fires us with a new or renewed interest in some special subject. General currents in medicine and enthusiastic study of its many special problems are, at least evidence of activity in our ranks. Recently unusual interest is apparent, at least locally, in the matter of intra-vascular complications following operation or injury. It is also apparent that either more such complications occur in these later days or that renewed interest in the subject is leading to the diagnosis of such conditions when in former times they were overlooked. Undoubtedly a certain percentage of morbidity and of mortality following surgical work is due to these causes and our interest is challenged. Your essayist can claim no unusual experience with the subject in hand. A few experiences are, however, apt to be impressive and it is hoped that, with the free use of the mass of literature now available on this subject, it may be presented in a way that will be provocative of thought and of a full and free discussion. A complete review of the subject in a short paper is not possible and consideration of less important lines of thought or of some closely related subjects are here treated briefly or are left out with the idea that discussion may, to some extent, be complementary. It will be well to remember at the outset that thrombo-phlebitis with the ever present possibility of resultant embolism is the one intra-vascular complication to be feared; that the origin of our

difficulties is practically always in the venous tree; and that the effects are local, in the neighborhood of the affected vein or, in the case of embolism, more apt to be general and on the arterial side of the circulation.

The incidence of thrombo-phlebitis is difficult of accurate estimation. Basham (Jour. Kansas Med. Soc., February 1928) quotes Klein of Vienna, who found this condition in 70 of 5851 cases. Hampton reports 205 cases of femoral phlebitis in 2100 post-operative cases. Bandy reports 1000 cases with 1.3% and Ranzi found 1.2% in 6071. It is probably approximately correct to estimate that about 1% of abdominal post-operative cases will be followed by phlebitis. It is certainly true that operative procedures on the uterus and adnexa are especially likely to be followed by this complication though it may follow operations in any locality. It may be remarked, incidentally, that thrombo-phlebitis may follow fractures, parturition and certain medical diseases as typhoid fever, etc. Miller and Rogers of Boston, who investigated 206 cases of thrombo-phlebitis found exactly the same number following non-surgical as surgical conditions. Most of the recognized cases occur in the veins of the lower extremities and it has been repeatedly remarked that seldom does embolism follow these easily recognized superficial cases. The proportion of emboli causing serious or fatal results to the number of cases of thrombo-phlebitis must be small. Hence we must have many cases of deep phlebitis which go unrecognized except in case of embolism with serious or fatal result. It is quite probable that not a few of the cases which show an abnormal post-operative febrile reaction and whose convalescence is not normal have thrombo-phlebitis somewhere. And careful routine autopsies would surely place some of our so-called myocarditis cases in the list of coronary occlusions and explain some other such cases as mesenteric occlusions and some sudden collapse and death cases on the basis of the blocking of an important vessel. In general, it is believed that we have underestimated the number and the importance of blood-vascular complications following tissue injury.

The cause of thrombo-phlebitis is a matter of much difference of opinion. Why it does not occur in many cases of heavy, crushing injuries or massive infection and why it does occur in other supposedly clean, carefully handled cases cannot be answered with any degree of certainty. For the purpose of discussion the question may be divided into predisposing and exciting causes. Listed among the predisposing causes are (1) Alcohol, tobacco and certain articles of diet. The

\*Read before the Jefferson County Medical Society.

causative influence of these irritants in thrombo-phlebitis is suggested by their being found in lists of causes of other blood vascular diseases, e. g. prolonged tobacco smoking is regarded by some (Silbert) as the immediate cause of thrombo-angiitis obliterans. (2) Intravenous medication (probably not valid) has been mentioned as a possible cause as has also the therapeutic use of metals. (3) Obesity is rather generally accepted as an important factor (Snell: *The Relation of Obesity to Fatal Post-op. Pulmonary Embolism*. *Arch. Surg.* 15:237, Aug. 1927). The obese patient moves about in bed less following operation and the circulation is more sluggish. (4) Trauma and operations for traumatic conditions show a high incidence for phlebitis and embolism (McCartney: *Pulmonary Embolism*, *Arch. Path. and Lab. Med.*, 3:921 June 1927). (5) Debilitating conditions, under nourishment, low blood-pressure states and dehydration post-anesthetic or other deserve consideration as causative factors. (6) Slowing of the blood stream by the quiet, recumbent position in bed after operation or accidental injury is thought to be an important influence. (7) Decreased B. M. R. following anesthetic, operation and the use of narcotics with almost absolute rest in bed has been advanced as a factor favorable to the occurrence of phlebitis and embolism. (Walters: *Reducing Post-Op. Pulmonary Embolism*. Ed S. G. & O., 45:238 Aug., 1927). (8) Pre-existing disease affecting the integrity of the heart valves or muscle, the vessel walls or the blood itself may more properly belong with the exciting causes but should be mentioned here. So, also should we think of pre-existing foci of infection. Anemias, primary or secondary, are said to be predisposing influences and the absorptions of tissue juices may be added to the list. The above constitutes quite an array of possibilities and each has had at one time or another a protagonist with a ready, supporting line of reasoning. No doubt several of the above influences will be found operative at one and the same time in most cases. Such has been my observation. The onstanding causes appear to be enforced quiet, decreased B. M. R. with slowed blood current.

In this connection and before considering the exciting causes the conditions determining the location of thrombo-phlebitis following surgery may be brought up for consideration. Of the cases which have been definitely recognized by far the greater number have been in the large veins of the pelvis and the lower limbs no matter where the operative trauma. Most have followed abdominal work and especially gynecological operations. It is known that most cases of thrombo-phle-

bitis occur in the lower half of the body and that veins of the left leg are most frequently affected no matter in what area the operative work is done. Exactly why is not known though not a few theories have been advanced and some experimental work has been done. Position in bed—head and upper trunk elevated with hips and legs lower—has been mentioned as of some importance though casts of iliac and femoral veins with the body flat and semi-sitting failed to show construction of these veins. (Patey, Mr. D. H. *Proc. of Royal Soc. of Med.* 1929). Large, long veins supporting heavy columns of blood at locations in which, under the circumstances, the influences normally forcing the blood forward on its way back to the heart are least effective is another suggested explanation. Unusual prominence of the sacrum with forward angulation of the iliac veins with possible slowing and eddying of the blood current in this area has been cited as a possible cause. The pump action of the venous return exerted by diaphragmatic and abdominal wall movements is undoubtedly much restricted in post-operative cases due to general weakness and relaxation, but particularly in abdominal work, to natural splinting, and may have a great deal to do with venous stagnation in the vessels below. Tight dressings and increase in intra-abdominal pressure from any cause may be thought of. In short, stagnation because of failure of the forces which normally overcome gravity in the venous tree, at situations most likely to such stagnation, seems to be the trend of our theories as to why phlebitis occurs in one vein and not in others. This seems to be in line with the thought that circulatory failure of any kind is apt to be first noted and most marked in the more dependent and distant parts. The same may be said, in general, though not without exception, of other diseases specially affecting blood vessel walls e. g. arteriosclerotic and diabetic gangrene, thrombo-angiitis obliterans, etc. Yet, all our theories fall short. Why with the blood vessels and, of course, the blood in the two limbs of the same individual under identical conditions, is this complication unilateral as it is in most cases? Why does the condition occur in the vessels of the left leg usually following such operations as appendectomy and right herniotomy? Such question remain unanswered and, looking to prevention, are of more than academic interest. Local trauma apparently has nothing to do with the condition and a blood borne infection is necessarily a general one. It is conceivable that a mild blood borne infection plus stagnation due to chance position for a time, or other factor, might produce changes in the endothelial lining of a vein and determine



a clot. Or, since thrombi are usually found sterile on culture, possibly altered blood chemistry following injuries, operations, acute fevers etc., plus stagnation may cause endothelial injury, with clot formation, only in the vessel in which the current was slow enough to allow the production of this initial damage. These are open questions. This brings us to the consideration of the exciting cause of thrombo-phlebitis. A voluminous literature chronicling many clinical observations and a great deal of experimental work on this phase of the subject leaves one in doubt. However, certain important facts have been established in this connection and authoritative opinion on points not yet beyond dispute may be had. Aside from the predisposing causes already considered infection and changes in the blood are usually thought of in this connection.

As to the matter of infection we may recall that cultures from thrombi are usually sterile; that thrombosis occurs not in the grossly infected cases nor in septicemias, as a rule, but more often in cases showing not the slightest clinical evidence of infection—clean cases: and that the symptomatology of thrombosis is not that of gross infection. Dr. W. Howell Evans (Proceedings Royal Soc. of Med., Vol xxii, No. 5, March 1929) states that "there is no convincing proof of the infectious origin of primary thrombi though it may influence the number of platelets and cause changes in the vascular endothelium. It is not a necessary factor but may be a contributing one." Aschoff (Thrombosis, Lectures on Pathology, Paul B. Haeger, New York, 1924, p. 253.) says "opinion as to the role of infection differs but that many fatal cases have followed clinically clean cases and closed fractures." Lister, W. A. (Statistical Investigation into the Causation of Pulmonary Embolism Following Operation, *Lancet* 1:111 Jan. 15, 1927) states that "pulmonary emboli following operation are probably not due to trauma or infection." The role of infection in the causation of thrombosis is apparently a minor one. Yet, Foulerton showed that B coli appear in the urine after practically every abdominal operation. Mr. Victor Bonney suggests the idea that bacteria migrate through the bowel wall after every abdominal operation and may be the possible source of the infectious origin of thrombi.

Changes in the blood following operations have been studied by numerous investigators. Among the recent workers is Andrews of Chicago, (Post-Operative Blood Changes. Edmund Andrews, *Annals of Surgery*. Vol. XCII, Oct., 1930) who made intensive post-operative blood chemical studies on patients

for 24 to 36 hours after operation and reports "no significant changes in the leucocytes, blood-pressure, temperature, pulse, blood sugar, water content of the blood, or chlorides or carbon dioxide though profound changes were noted in the mineral salt balance." Bancroft, Kugelmass Stanley-Brown (*Annals of Surg.*, Vol. XC, Aug. 1929) have published their preliminary reports on "Evaluation of Blood Clotting Factors in Surgical Diseases." Their work is based on the assumption that since many patients who have present all the factors thought to be favorable to the production of phlebitis or thrombosis do not develop the condition while others with a minimal number of the factors present readily succumb there must be a variant in the constituents of the blood which predisposes to it. It is significant, incidentally, that they finally omitted bleeding and clotting time in their work with the statement that "no true indication of the degree of the patient's blood coagulability was thus obtained." It has been suggested that anesthesia and operation may disturb the balance between the coagulant and the anti-coagulant elements in the blood. Any extensive discussion of the subject of blood clotting is beyond the scope of this paper but the bearing is so direct that it may not be left out entirely. It is well known (Dr. W. Howell Evans) that tissue juices contain a thromboplastic material capable of initiating coagulation and also that there is a something in injured tissue which provokes increase in blood platelets. Detached muscle tissue is sometimes used to control bleeding (in bone) and platelets are understood to be a definite kind of cell arising from the bone marrow and which by their degeneration furnish material which in turn is intimately associated with process of clotting. It has been suggested that the tendency to clotting may be indicated in any disease by the platelet count. Platelet counts are high from about the third to the tenth post-operative day and seem to be in proportion to the amount of tissue injury and the absorption or break-down products. Further, the first step in thrombus formation is the adherence of platelets to the vessel wall. It is stated (Evans) that shed blood in which platelet degeneration is prevented shows no tendency to clot. In this connection we may recall that blood drawn through a double needle so as to touch no tissue may be kept fluid in a test tube three weeks (Mr. J. P. Lockhart-Mummery. *Proc. R. S. of Med.—Med.*, 1929). And John Hunter proved by carefully ligating the veins in the neck of a horse that the blood remained fluid after two weeks. This experiment has been rechecked in more recent times. The occurrence of

thrombosis at about the time when absorption of wound products is active is suggestive and, in view of the above, it may be reasoned that breakdown tissue products either directly or by inciting a rise in platelets and along with slowed blood current, etc. have an important part in thrombus production. Again, it has been noted above (Andrews) that there are profound changes in the mineral salts of the blood following operation. Are such changes in the direction of increased coagulability and tendency to thrombus formation? The evidence at hand is apparently against such conclusion. At this juncture it is interesting to note that since the suggestion of Walters and of Whipple there is widespread use of calcium preparations pre-operatively in cases in which hemorrhage is feared: yet, calcium deficiency has not been demonstrated in such cases even in the presence of jaundice and recent studies of Ravdin, Riegel and Morrison (*Annals of Surg.*, Vol. XCI. No. 6, June, 1930) are summarized by the statement that ionized calcium does not favorably affect the coagulation time of normal or jaundiced dogs except in rare instances but that glucose, on the other hand, by mouth or intravenously does. Other blood elements have been studied in this connection but definite conclusions as to the relation of changed blood chemistry to phlebitis, arteritis and thrombosis are not at hand at present.

The symptomatology of post-operative pathological conditions of the superficial vessels, particularly of the extremities, is too well known to warrant repetition here. Changes in the deeper veins will remain a difficult diagnostic problem except in cases in which very important vessels are involved, in which dramatic crises are brought about by emboli or in which careful post-mortem examinations are done. Recently an attempt has been made to set up a minimal list of symptoms on which a diagnosis of thrombosis or embolism is justifiable. In view of the extreme difficulty in some cases such standard should prove helpful.

In spite of the fact that general agreement on the problem of thrombosis and embolism is lacking prophylaxis is thought to be of first importance and, in view of what is known of the subject, the following are recommended: (1) Pre-operative preparation should include the elimination of foci of infection, the correction if possible of shock, low blood pressure states and anemia (transfusion, etc.) (2) Gentle handling of tissues. (3) Care in dissections about important blood vessels, care in placing ligatures and care in placing drains. (4) Avoidance of prolonged anesthesia, hemorrhage and shock. (5) Position in bed to favor circulation in

the distal parts and frequent change of position especially of the limbs. (6) Supportive bandages if varicosities are present in the legs. (7) Cardiac stimulants may speed up the circulation when depressed. (8) It has been suggested (Nesbitt-Jour. of Okla. State Med. Assn. Nov., 1929) that in cases in which clotting is feared that 15 c. c. of sod. citrate be given intravenously but the basis of this seems unsound. (9) Careful investigation of already existing circulatory disease conditions with remedy if possible. Once the condition has actually occurred and been recognized the treatment consists in absolute rest of the part with bandaging and elevation and the application of heat. Massage is interdicted as it may favor the breaking up of the clot and embolism. Numerous more or less ineffective medicaments have been used as local applications to the affected part. Pain relief may be required. If fragments of clot break away and drift with the blood stream the heart or the arterial tree will be the site of lodgment and the treatment of embolism of venous or of actual cardiac origin belongs to the consideration of the arterial complications.

**Summary and Comment.** The blood vascular complications of importance following surgical procedures are thrombo-phlebitis and embolism. These complications are known to cause a small percentage of our morbidity and a smaller percentage of our mortality in surgical work. It is thought that some cases are overlooked even on post-mortem examination. Thrombo-phlebitis is a many-sided problem and general agreement as to many of its features is lacking. Much work has been done on the difficult problem of the exact cause of these conditions and because this problem is unsolved it is commented on here at some length. What is known concerning the cause of the condition should render prophylaxis fairly effective. The condition when actually present and recognized usually responds to the well established routine of treatment with canalization or the establishment of collateral circulation and return of function of the part affected.

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**Contraction of Gallbladder.** — Chiray and London present the results of roentgenography of the gallbladder after stimulation in three cases from their material comprising 600 observations. The contractions occur rapidly within from two to three seconds and according to the authors give proof that the gallbladder is a contractile active reservoir. They point to the development of the technic of inducing and recording the contractions which may be used as a guide in testing the functioning of the gallbladder.



INTRA-VASCULAR COMPLICATIONS  
IN SURGERY. THE PULMONARY  
SYSTEM\*

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There is no more appalling happening in surgery, none more shocking to the family and surgeon than those of major character involving the pulmonary vascular supply. Occurring at a time when the patient has as a rule completed convalescence, when the immediate operative danger period has been successfully passed, at a time when the patient is no longer bedfast and is looking forward with pleasurable anticipation to leaving the sick room and the hospital, pulmonary embolus or thrombosis is, next to death on the table, the most tragic event which may ensue as a sequence of operative interference. To the master pathologist Virchow, who first brought embolism to our notice, we are indebted for almost our entire theories of vascular occlusion due to floating bodies as well as that of thrombosis. His studies occupying the decade from 1846 to 1856 were confirmed and elaborated by many observers notably Cohnheim and Cohn. Of the latter's work in 1860, Welch in his classical review forty years later says "It is extraordinarily rich in anatomical, experimental, and clinical facts and it is well for any one who believes he has a new observation or opinion concerning embolism to consult it before venturing on publication; a precaution which has evidently been often neglected by writers on the subject." So I think having followed the above advice, no apology is requisite if in this paper nothing new is offered and if it is merely a reminder of known pertinent facts concerning the pathology with possibly some later ideas regarding prevention and treatment.

In a study of pulmonary or any type of embolism for that matter we must bear in mind the effects of vascular occlusion, arterial and venous, which depend not only upon the size of the vessel but the rate of occlusion and the collateral blood supply. For instance if the collateral circulation is, even though abundant, by vessels of small size as in the heart, blocking of a vessel, the coronary, may nevertheless lead to sudden death. I would also call attention to the effect of blocking a large branch of the superior mesenteric, notwithstanding the anastomosis between it and the pancreaticoduodenal above and the inferior mesenteric below. "It is not the existence or non-existence of anastomosis that should trouble us but the presence

or absence of sufficient anastomosis." This has a very practical bearing in the technique of resection of the transverse colon which need only mention. It should also be borne in mind that at the cortex of certain organs there is an anastomosis between the periphery of the organ and its capsule and that while this is very meagre it plays a distinct part in the changes occurring following occlusion of terminal vessels at the surface of the periphery of such organs. Again in the liver and the organ under discussion there is a double blood supply hence we may have modifications of the processes which usually take place.

Without going into detail it is for the above reasons that peripheral and at times more central blocking of a vessel in the lung does not terminate in necrosis, why the infarct remains a red infarct and why, notwithstanding red corpuscles may escape into the alveoli, vitality is maintained. Should the infarct not completely resolute, should it go to the stage of a 'white' infarct as is so often the case in the smaller occlusions near the periphery, they are always noted as wedged-shaped areas extending not to the surface but just beneath it. In the lung often the infarct is imperfect and if so does not result in necrosis but goes on to complete resolution, or it may, if small, as a result of leukocytic action undergo organization and cicatrization. Larger ones often undergo putrefaction with suppuration and abscess formation. Should a main vessel or the pulmonary artery become blocked death as a rule ensues and it is this type that we had in mind in the opening sentence of our paper.

We are of the opinion that smaller infarcts resulting from surgical operations are of not infrequent occurrence, even though often unrecognized as such and often the symptoms misinterpreted. In the absence of frank pleuritic effusion or fluid our belief is that the not uncommon post-operative pleuritic stitch or so-called localized pleurisy requiring strapping, is of thrombotic origin and is septic in character. Doubtless many of the post-operative pneumonias involving only a small area of one lung lobe are of similar origin and it is of course a question open for discussion as to just how many lung abscesses following tonsillectomy may be of the same causal nature. While this minor type of embolus is of much interest not only as to its etiology and as to its prevention by a more scrupulous aseptic technique, it is to the almost universally fatal massive blocking that we would direct your attention.

From even a merely cursory review of the literature pulmonary embolism would seem to be upon the increase, particularly in older subjects. Quoting Henderson's statistics from

\*Read before the Jefferson County Medical Society

the Mayo Clinic there were 313 cases in the ten year period from 1917 to 1927, there were 46 non-surgical fatal cases. Kuhn of Freiberg has recently reported the increase in Germany in fatality from this cause from 1.3% in 1924 to 4.9% in 1927 where as in 1927 thrombosis was found in every fourth body examined and fatal embolism was found in every twentieth body. In the series of 4,500 surgical cases reported by Walters, pulmonary emboli were found at necropsy in four cases though three of the patients had advanced cardiac disease and were over seventy years of age. In two of the cases pulmonary emboli were found unexpectedly at post-mortem though death was the result of uremia in one and in one of sepsis. The other patient had auricular fibrillation and died on the 6th day following her operation. Wilson in over 63,573 operative cases found a mortality of 0.07%. In this group were a total of 1346 breast operations and 449 vaginal hysterectomies among which however there was not a single case of pulmonary embolism. In 1712 abdominal operations in this same series there were five fatal cases of embolism or one in every 342. In a group of 40,449 operations of various types embolism was found in 0.12%.

It is generally recognized that in pelvic operations by the abdominal route in both male and female that the occurrence of this disaster is the most frequent and it would behoove us then to look well into the causative factors. These have been generally accepted as depending:

(1) Upon slowing or stagnation of the blood stream with a decrease in blood pressure following operation;

(2) Eddying of the blood current as pointed out by Von Recklinghausen;

(3) Loss of integrity of the vessel wall with damage to the endothelium from bacterial or other cause;

(4) Decrease in metabolism with increase in the viscosity of the blood;

(5) Changes in the cellular constituents of the blood among which may be mentioned hemolysis which may be the product of cell degeneration or of a bacterial activity.

Under this latter causative factor as well as that due to damage of the vascular endothelium, may be mentioned the bacterial action on blood clots which follows ligation of its mesentery in the removal of a gangrenous appendix, also in the ligations in abdominal hysterectomies and oophorectomies particularly for large growths. The large mass ligature in the pelvis or anywhere for that matter is a very potent source of danger. It is not infrequent to see phlebitis following such operations and such technique in the placing of ligatures. This is always due to extension

of an infectious process into the vein. It is not a long cry from such conditions to massive pulmonary thrombosis.

If one studies the deaths from pulmonary embolism they fall naturally into three classes:

(1) Those that occur immediately with only a small portion of the pulmonary circulation obstructed;

(2) Death in a few moments due to complete or almost complete blocking of the pulmonary circulation;

(3) Delayed deaths due to an increase of thrombosis following an initial blocking by an embolus of a small portion only of the pulmonary circulation.

In this discussion we have said nothing of those emboli following fractures; viz. fat emboli. They are, however, a source of danger which is to be remembered especially by the bone surgeons, though they may also occur as a result of operative handling of fatty tissues. Another reason for gentle surgical manipulation.

At this point I would like to call attention to an article by Patterson of Rochester, N. Y. in the October 17th issue of the Journal reporting two cases of fatal oil embolism following dilatation of the urethral stricture with oil after the method recommended by Sir Henry Thompson in 1888.

I would also call attention to an editorial in the same issue commenting upon an article by the son of one of our local Master Surgeons, Dr. A. Morgan Vance. This work of his son's Dr. B. Morgan Vance, is a most interesting report, one which does him and his illustrious father great credit and which I know would for that reason if no other interest the members of this society. One paragraph of the editorial I will quote verbatim:

"Fat emboli which pass in large numbers from the pulmonary circulation into the arterial circulation may be distributed to all organs of the body, especially to the brain, the heart and the kidneys. The most prominent symptoms are caused by fat lodging in the brain. In such cases Vance divides the progress of the condition into three stages: first a period of from forty-eight to sixty hours between the trauma and the appearance of the symptoms; next the soporific stage, ushered in by dyspnea, restlessness, precordial pain and a higher pulse rate. In this stage the fat probably is passing through the capillaries of the lungs into the arterial blood, and the symptoms are due to difficulties experienced by the right side of the heart during this process. Cerebral symptoms then arise; the patient sinks into a stupor and gradually passes into the third stage, that of coma. The cerebral type of fat embolism



may be overlooked if an injury of the head is present.

This study provides further evidence that one of the true etiologic factors in fat embolism is trauma to the adipose tissue frequently produced by fractures of bones. Alleged etiologic factors, such as burns, poisons, lipemic conditions due to natural causes, and post-mortem processes, did not prove to be important."

So also have we not touched upon that very interesting type of embolus, pulmonary in character, which is observed during pregnancy due to the carrying into the circulation of placental villi. Such may occasionally be a cause of sudden death either during pregnancy or the progress of labor. Most often though they go unrecognized or are even symptomless with subsequent disappearance of this cellular metastatic embolus. A study of this subject alone would intrigue one into an essay of large proportions and it, as that of fat emboli are only mentioned. *En passant*.

Notwithstanding the striking picture in pulmonary embolus it is not at all times an easy matter to make a definite and positive diagnosis and mistakes have not infrequently been made as shown by subsequent autopsy. Thus in the series of cases collected by Cappelletti the clinical diagnosis of pulmonary embolism was found to be wrong in nine cases out of twenty-six, the mistake in a number having been made of interpreting cardiac insufficiency as embolism. Riedel gives two cases from Denk's clinic in which cardiac insufficiency also interpreted as embolism were operated upon with fatal result. Nystrom says he also made the mistake of interpreting uremia for embolism.

Pulmonary embolism may appear under various forms and the most common symptoms when death does not ensue at once are accompanied with a shortness of breath, anguish, feeble pulse, paleness and cyanosis with a stitch or pain in the chest. These symptoms may exhibit wide differences as to quality and intensity. There may be a feeling of marked constriction of, with girdle sensation around the chest which may be accompanied with vomiting. "In other cases the attack may resemble very closely that due to cardiac insufficiency or anemia of the brain." We have known a case to be mistaken for an attack of epilepsy, the prominent symptoms being convulsions, loss of consciousness, frothing at the mouth and blood stained saliva. Nystrom called attention to a matter of very great interest; namely, that the pulse need not be at all accelerated.

From a practical standpoint we ask ourselves is there any means of preventing this terrible surgical calamity. We believe that

following the plan of Walters of the Mayo Clinic with attention to the work of some other observers that it is quite possible to lessen the incidence of this complication. For sometime now in many of the German Clinics based upon the assumed changes in metabolism and the slowing of the blood current, it has been the custom to administer small doses of thyroid or thyroxin post-operatively. The recent excellent work of Bancroft in a study of the prevention of emboli stresses several factors which are quite striking. Attention is also again directed to infection and trauma. He cites the work of Mills in connection with the effect of diet upon the viscosity of the blood and basal metabolism in connection with blood clotting. For instance a carbohydrate and fat diet while raising the metabolism does not increase the clotting while a protein diet not only raises basal metabolism but definitely increases the blood clotting elements. He attributes this to some unknown factor connected with protein metabolism.

Patey in some very careful experimental studies has shown that unquestionably following abdominal operations there is very frequently a reduction in the depth of normal respiration and that in the cases studied by him there was shown a decided effect following abdominal operations not only in the movements of the diaphragm with marked respiratory variations of intra-abdominal pressure but also on the vital capacity and tidal air. Bearing these studies in mind and until more definite facts are known concerning the mechanics and chemistry of blood coagulation patients should not be purged preceding operations but blood fluids should be kept at a very high level. Also the strength of the heart should be kept up by the pre-operative administration of digitalis. Extreme care should be taken to prevent loss of blood and unnecessary trauma especially by large mass ligaturing. Needless to say one's technique must be kept flawless and every effort should be made not only to attain this technique and to perfect it but also to maintain it. After the operation the patient should not be allowed to remain in one position very long. The position of body and also the extremities should be frequently changed. Moderate exercise of the arms and legs should be begun as early as possible. The patient should be urged to breath deeply and small doses of desiccated thyroid may be given for a number of days post-operatively with advantage.

So much for prevention, but what are we to do after the pulmonary vessel is blocked with an embolus. In 1908 Trendelenburg reported to the German Surgical Congress his research on embolectomy of the pulmonary artery describing the first two operations

performed in man for its relief. Since his report some 30 operations have been published in the literature.

Nystrom has a most fascinating article in the October 1930 *Annals of Surgery* reporting his own and other cases operated on up to that time. In this report 19 cases surviving operations are cited. Westerborn called attention to 2 cases which through typographical error were overlooked and reports 23 cases which survived the operation 6 of which were discharged from the hospital as well. When one takes into consideration the certain death which follows massive pulmonary embolism, this is a remarkable achievement.

Nystrom's report and the one by Meyer of Berlin published in *S. G. & O.* for May 1930 read like the most thrilling and absorbing novel and we recommend their study as well as that of the article by Bancroft and the paper by Walters to those who are more than casually interested in this subject.

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#### DISCUSSION

**Emmet F. Horine:** The historical background of vascular surgery is quite interesting in that more than one hundred and twenty years elapsed between the birth of the idea and further work toward the solution of the problems concerned. Apparently in 1759 a surgeon of New Castle-on-Tyne named Lambert suggested closing an arterial wound by the introduction of a pin. Shortly after this suggestion Hallowell closed a bleeding aneurysm by inserting a pin through each edge of the wound and then wrapping a string around the pin. Success followed this technique and several other cases were tried in a like manner. Twelve years later Assmann made animal experiments which were uniformly unsuccessful leading him to state that vascular

surgery was not feasible. It was not until 1881 that Gluck again attacked the problem with some success. Out of his work has grown the modern technique used at present.

When the circulation through the heart has slowed and especially when the auricles fail to empty themselves as occurs in auricular fibrillation large clots may form. These so-called bland thrombi appear in various types of chronic heart affections and wasting diseases. Thrombotic vegetations may be present in acute and sub-acute endocarditis. Mural thrombi covering circumscribed areas may be encountered as a result of coronary occlusion. Ball or pedunculated thrombi are relatively rare. Naturally any of these thrombi or portions of them may be forced into the circulation finally to be lodged in some portion of the arterial tree.

Dr. Hume mentioned that in thrombosis of the lower extremities the left side was most frequently affected. This is certainly true. Possible explanations are that the left common iliac vein is much longer than the right. Further the left is more obliquely placed and is crossed by the right common iliac artery. Also its situation is such that it is liable to pressure from an over filled sigmoid flexure or rectum. An additional factor should be mentioned based on the work of McMurrich who in studying cadavers found 30 per cent of congenital anomalies in the common iliac veins which resulted in a diminution of their lumen. The most interesting point was that he found these congenital defects on the left side in 90 per cent of the cases.

A very interesting and unusual type of embolism is the crossed or paradoxical one. By this we mean an embolus in the arterial tree whose point of origin has been on the venous side and which has reached the left side of the heart without passing through the lungs. It has been shown that such emboli pass through an open foramen ovale. Pathologists tell us that autopsies show from 20 to 45 per cent of open foramen ovals.

Peripheral venous thromboses occur occasionally in advanced heart failure and often go undiagnosed because of the accompanying and often marked oedema. In surgical work Dr. Hume is undoubtedly correct when he calls attention to the possibility that certain surgical cases making a slow convalescence with an unexplained slight fever may have a thrombophlebitis.

A diagnosis of embolism is, in the usual case, not difficult since there is sudden onset of pain, numbness and evidence of a disturbance of the circulation in the part affected. Further suggestive evidence is present if there is a co-existent heart defect notably a mitral stenosis and auricular fibrillation, or a history of a recent coronary occlusion or recent infection or operation which might have lead to a thrombosis. 1



may digress a moment by saying that occasionally a coronary occlusion may occur without pain and that the diagnosis may be suggested by embolic phenomena.

Prompt embolectomy is imperative. If more than twelve hours elapse before operation the chances of success are remote. The reason for the necessity for early operation is that arterial thrombosis develops rather early below the obstructed area. Naturally no good would result unless the operation is performed before this occurs.

In recommending operation no set rules can be given it being necessary to weigh every factor in each individual case. Undoubtedly the presence of multiple emboli constitutes a contra-indication to operation. In embolectomy the anesthetic of choice is local.

**A. J. Miller:** I wish to call attention to the great variation of reports of instances of embolism post-mortem. Personally, I think there is no subject that has caused more perplexity and work than the search for emboli in patients clinically dying of embolism.

Usually death from pulmonary embolism is easily demonstrated; the clot is so obvious that its recognition is easy. In the case of the brain, it is possible, I presume, for embolism of the brain stem to cause quite sudden death even if a very small area is involved; but it is demonstrated with much difficulty. In the case of coronary embolism, there is much variance between the post-mortem findings and the clinical interpretation. Some of this variance is no doubt the result of examiners using different criteria for the recognition of anti-mortem clots. If the clot which is the embolus forms a short time before death, it is not possible by any method of examination or testing to differentiate between a post-mortem and an anti-mortem blood clot. The changes which make the differentiation possible are post-mortem changes in the blood clot. If sufficient time has elapsed for these changes to occur, the differentiation is possible; otherwise, not.

I should like to mention that in fat embolism, the masses of lipoid substance may form by coalescence of the emulsified fat in the plasma. These masses may be in sufficient quantity to do severe damage or bring about death, having been formed in the blood stream.

In infections and in the case of neoplastic diseases, the possibility of embolism should always be borne in mind during surgical procedures and also in physical examination of patients. In infectious diseases in which there is destruction of tissue, such as tuberculosis, staphylococcus infections and syphilis, there are always thrombosed vessels. The thrombi are continuous with inflammatory exudate and tumor. They are easily dislodged. If we do any manipulation of the lesion during the examination or surgery, metastasis of tumor or bacteria

may result. I believe it is a mistake to squeeze a boil; it should be opened gently and allowed to drain with as little trauma to the tissues as possible. In diseases in which the vessels are not invaded or thrombosed, there is little possibility of dislodging emboli. The method of removal of neoplastic or infected tissues should be directed with this point in mind. It is gratifying to see most operations of the breast, for instance, being continued from the axilla toward the median line rather than from the median line laterally, for the purpose of blocking off the lymphatics and blood vessels at the axilla and in that way materially lessening the instance of transplantation.

**Morris Flexner:** My case which Dr. Sherrill included in his report is one of the most unusual I have ever encountered and I will probably never see another one like it. After we had made a definite diagnosis of aortic thrombosis, the question as to the method of procedure naturally arose. I feel that Dr. Sherrill gave this man his one opportunity to live, and should the situation be repeated I would be willing to follow the same procedure. Among the interesting findings at autopsy was an aneurysm of the heart secondary to the coronary thrombosis. Recently in Baltimore I heard Dr. Emanuel Libman discussing the question of aneurysm of the heart following coronary thrombosis; he made the statement that it occurred somewhere within the neighborhood of 30% of the cases, asserting also that it is not a very difficult diagnosis to make.

Dr. Hume made the statement that sodium citrate administered intravenously might help prevent some of these post-operative thromboses. This is in distinct contradiction to my understanding of the problem, as sodium citrate is supposed to behave differently *in vitro* and *in vivo*. Baer of Mt. Sinai showed some years ago that sodium citrate solution injected intravenously destroyed blood platelets and liberated thromboplastin which would tend to make the blood clot more rapidly. At one time intravenous injections of sodium citrate solution were advocated for hemorrhage from gastric and duodenal ulcer, as well as pulmonary hemorrhage.

**O. O. Miller:** One is impressed by the increasing frequency of pulmonary embolism.

In the Journal American Medical Association, of October 17, 1931, page 1162, the Berlin correspondent quotes E. Payr, citing that in his opinion the exhaust gases from the modern automobile and manufacturing plants, was a factor in the production of pulmonary emboli, especially so since the greatest number of cases occurred in city dwellers. Upon his suggestion Dr. Kuntzen conducted a series of animal experiments on rats and rabbits in which he exposed the animals daily to the inhalation of two to three liters of exhaust gas. This treatment was

continued for two-and-one-half months, and at the end of that time an injection was made into the portal vein; this slight injury was sufficient to cause the death of four out of fifteen treated animals within from twenty-four to twenty-eight hours from thrombosis of the portal vein, whereas the control animals showed no disposition to thrombosis.

With the increasing popularity of artificial pneumothorax, one must not overlook the ever present hazard of air embolism. Whenever this occurs, the marked dyspnea, marbling of the skin, dilated pupils and clammy perspiration testifies eloquently to an embarrassed circulation. The treatment in such conditions is prompt artificial respiration. Several cases have been reported where the patient had a complete hemiplegia which cleared inside of twenty-four hours.

**A. C. McCarty:** I have enjoyed very much the interesting points brought to light in the papers of the evening. I speak simply to emphasize the point made by Dr. Sherrill and stressed by Dr. Horine—namely, that embolic phenomena must be treated early by surgical methods when possible. If this is not done thrombosis is sure to follow and then surgery is of no avail.

This is well shown in the first case reported by Dr. Sherrill. For the first six hours after this man received a blow in the abdomen there was little to discover of an abnormal nature save for profound shock. During this time the abdomen was being watched for signs of hemorrhage or peritonitis. These signs did not occur but in their stead the affected limb became white, painful and swollen and the pulse disappeared. It was at this time that spinal punctures ruled out central nervous system involvement and then intra-abdominal operation was undertaken at an hour which was evidently too late.

I am firmly convinced that had the correct diagnosis been made early and an operation performed under spinal anesthesia this man would have had a fair chance of recovery. This was an industrial accident, but an abdominal blow of this same nature might easily result from an automobile or other common accident and I should like to urge all present to bear in mind an embolic phenomenon. Early diagnoses and surgical intervention may secure brilliant results whereas late intervention is fruitless.

**W. M. Weiss:** Because of the intimate relation of the oesophagus to the left auricle, the former is compressed and displaced by the latter in mitral stenosis. Hence the stomach tube should be used with extreme caution in patients with mitral stenosis since thrombi already present from the sluggish circulation can be readily dislodged from the dilated left auricle. The deviation and displacement of the esophagus can be well visualized on the fluoroscopic screen when the patient is in the right anterior oblique

position and a thick barium mixture is swallowed.

**Woodford Troutman:** I have recently seen some ten of twelve-hundred autopsies, over a period of about ten months, and it was alarming to note the number of cases of embolus and thrombosis in this group of autopsies. Dr. Chiari, a pathologist in Vienna, has some very definite ideas about the causes of thrombi and emboli, and I am passing his opinions on to you. He groups the causes under three headings, which probably cover the field: (1) Diseases of the intima; (2) Stagnation of the blood; (3) Alteration of the blood. I believe one of these three etiological factors would probably account for any embolus or thrombosis. One probable cause of left-sided embolus in women would be an anatomical difference which exists in the lower pelvis: the ovarian vein on the left side empties into the left renal vein, while on the right side the ovarian vein empties directly into the inferior vena cava. Certainly, we can understand that there would be stagnation of the blood on the left side due to this anatomical variation. Also in women, (we do not know just why) thrombosis very often occurs in cases of myomata of the uterus.

In the male, the spermatic and prostatic veins should always be looked to for emboli.

**H. M. Rubel:** I enjoyed the papers in this symposium very much indeed, and think that the Society is indebted to each essayist for his clear and comprehensive presentation of this subject.

From an obstetrical standpoint, I am naturally most interested in thrombosis of the vessels of the lower extremities. The condition known as phlegmasia alba dolens follows the direct extension of a thrombotic process from the pelvic veins. Occasionally the thrombophlebitis can be traced from the uterus to the common iliac veins, upward to the vena cava, and downward through the external iliac to the vessels of the leg. While it should be borne in mind that, clinically, Phlegmasia Alba Dolens is caused primarily by puerperal infection, we know that at times it is hard to discover. I have had several cases in my own practice in which the patient had never been examined, and after the tenth day this complication followed. Again, mechanical factors may influence this condition, as well as pressure exerted upon the intrapelvic veins by inflammatory exudates.

The symptoms usually do not make their appearance until one is almost ready to dismiss his patient from the hospital. A slight rise in temperature, pain in one leg, usually the left, extending along the course of one of the larger veins, oedema, from the foot and ankle and maybe up as high as the upper portion of the thigh, ushers in this condition. The leg becomes swollen, skin glazed and tightly stretched, and



pits on pressure. This usually lasts for several weeks, but months may elapse before the patient again regains the full use of the leg. An elastic stocking is ordered, as a rule, to control the oedema when the patient is again up and about. The usual treatment is rest, elevation of the involved limb, and warmth. Some practitioners find ichthyol either as an ointment or as a 20% solution for painting the leg, most helpful. No massage should be allowed, on account of the possibility of detaching portions of the thrombus with the danger of a generalized condition resulting.

In cases of pyemia in which infected thrombi are carried from the uterus to various portions of the body, hysterectomy may be useful. Again, the suggestion of Freund and Bumm may be more practical: that the thrombosed vessels be exposed by laparotomy and excised or ligated distal to the thrombus. Dr. J. W. Williams found this radical operation successful in some of his cases.

**Harry Goldberg:** From an orthopedic point of view, I want to call attention to the fact that fat embolism may occasionally follow manipulation of joints for correction of deformity, especially in cases of arthritis deformans. This condition is most apt to occur in those cases where the x-ray shows bone atrophy of the extremity from disuse.

I have seen two cases of this nature in which embolism followed manipulation of the knees for the correction of deformity in cases of arthritis deformans.

These patients became cyanotic following the manipulation, passing into deep coma later, and and finally ceased to breathe within 24 to 36 hours later, in spite of intensive restorative measures. The autopsies revealed not only fat emboli in the lungs, but also in the brain as well. The knee showed that the cancellous bone was filled with good deal of fatty marrow and that it had been crushed during the manipulation. The intra-articular fibrous adhesions were not touched by the manipulative procedure.

Fat embolism is one of the complications one should always bear in mind in carrying out manipulative procedures.

**J. G. Sherrill,** (in closing): The complimentary discussion of the fellows is most gratifying since there has been no contradiction or controversy concerning the views expressed.

Von Recklinghausen and Virchow taught that anti mortem clots are adherent to the vessel walls, while those occurring post mortem are readily separated. It would appear that this method of determining whether a clot occurred before or after death, is more reliable than depending upon the color of the clot itself. The white clots are more likely to exist longer than the red.

In suturing a vessel wall in Embolectomy, the suture should be placed by transfixing the vessel wall so as to bring the intima into direct

contact on each side of the wound. This brings the endothelial surface into contact and acts just as does the peritoneum which is sutured in the opposite manner—by infolding. The hemorrhage is readily controlled in these operations either by digital pressure or by the use of a tape around the vessel, with traction. A rubber covered clamp will also prove satisfactory, but has the disadvantage of damaging the already damaged vessel wall.

With reference to thrombosis in the veins, I have seen some peculiar cases. Recently, as the result of an infection of a finger from tularemia, a patient who had very large varicose veins in the leg, showed a marked phlebitis. The phlebittis directed attention to the tularemia which had been previously overlooked, and resulted in obliteration and cure of the varicosity. This result resembled exactly what is hoped to be obtained in the injection treatment of varicoses. Three important things predispose to the development of thrombosis within the lumen of the vessel. These are damage to the wall of the vein—particularly the intima, slowing of the circulation and change in the blood itself. The actual exciting cause is usually infection. Certainly a combination of all of these conditions readily results in coagulation of the blood within the vessel wall.

When we consider the number of vessels around the neck of the uterus and the almost universal presence of bacteria in the vagina, it is not difficult to understand the manner in which autogenous infections occur in puerperal women. Where an expectant mother has a profuse vaginal discharge, smears should be taken some time prior to delivery, the bacterial flora studied, and if pathogenic bacteria are found, the proper treatment instituted to restore a healthy condition. By following this plan, the percentage of puerperal infection would be materially lessened. In the treatment of puerperal phlebitis, rest in bed with elevation of the limb is the usual plan followed. One is led to ask the question of why a more prompt recovery would not be obtained by operation, ligation of vein and removal of the clots just as is done in thrombosis after mastoid operations or for phlebitis elsewhere. I believe that by double ligation of the vein in the meso-appendix in the case of gangrenous appendicitis, the possibility of a thrombosis in the portal vein is to a large degree prevented.

One of the most troublesome things we meet is mesenteric thrombosis, and the mortality is very high. With Embolectomy and several openings in the vessels damaged, it may be possible to wash out the clots and prevent necrosis of the intestine. The usual treatment previously employed has been wide excision of the gut, and anything that will lessen the extent of such treatment offers to prove beneficial to the patient.

## WAS IT AN ERROR IN DIAGNOSIS?

CHARLES G. LUCAS, M. D.

Louisville.

Mr. X, aged 51, consulted me November 17, 1927, with the following history: His father had died of pneumonia; mother was living and well. One sister died of tuberculosis and one sister of septicemia. Eight brothers and two sisters living and well. He had had the diseases of childhood; also typhoid twice; was jaundiced once as a boy; and had passed ureteral calculus 25 years before. For the previous 12 years he had had a great deal of trouble with gas in the stomach, but no pain until seven months before, though occasionally he would have trouble getting his breath. He attributed this symptom to the chewing of tobacco, for it was absent during periods of abstinence and he would gain weight. During the past year he had had two attacks similar to the present. The present illness began about September 1st, when he was awakened at night with acute pain in the epigastrium, was nauseated next day and vomited. No blood was seen in the vomitus. He had no food relief from the pain, but at times thought that soda helped relieve both the pain and the gas. He had lost 30 pounds in the past year.

Physical examination revealed the following: Weight 126; a year previously 155. Sensory, motor and reflex function appeared normal. His teeth had been removed six years before, and he was wearing two dentures that fitted well. Nasopharynx not congested, pupils would react to light and accommodation. Tongue was large, clean, shiny and slightly moist. On palpation, there was a feeling of fullness under right costal arch, with some tenderness. This was also present in the right iliac fossa, and he was somewhat tender above the umbilicus in the median line. The area of liver dullness was normal. Heart presented no evidence of enlargement, arrhythmia, nor adventitious sounds. Lungs showed normal resonance, breath and voice sounds; no rales nor friction rub. A palpable lymph node  $1\frac{1}{2}$  cm. diameter was found in left supra-clavicular region. A slight edema of the abdominal wall was noted after examination.

Blood examination showed Hb 72%, reds 3,888,000, whites 8,200, color index 1; differential showed polys 72, small lymphocytes 20, large lymphocytes 4, eosinophiles 2, mononuclears 2.

The examination of the urine made at the office showed amber, clear, acidity 38, specific gravity 1033, no albumin, no sugar, no bile, and, microscopically, was negative.

He was sent out to St. Joseph's Infirmary for further observation. A specimen of urine passed the following morning showed specific gravity of 1036, acidity 88, trace of albumin, and an occasional granular cast.

The gastro-intestinal X-ray was made on November 19th, and the following report was made by Sidney Johnson:

"The esophagus filled and emptied normally. The stomach showed a large filling defect, involving practically all of the body of the stomach. The fundus filled normally and showed some enlargement, the barium accumulating above the filling defect which appeared to be more or less annular in character. There was no marked obstruction; the pars pylorica filled readily; the duodenal bulb filled immediately and was of normal contour. Emptying time of the stomach approximately normal. Twenty-four hour examination showed normal filling of the colon. The gastric filling defect presented irregular ragged margins characteristic of advanced malignancy."

He was seen the following day by Dr. Irvin Abell, at my request, and the following is Dr. Abell's consultation report:

"Inability to relax abdomen prevents satisfactory palpation; no mass felt.

X-ray shows such huge defect in lesser curvature of stomach that cancer is undoubtedly present and to such degree that relief by surgery is extremely questionable.

Would recommend exploratory operation at request of patient."

Test meal was given him the following morning and 75 cc. aspirated at the end of an hour, and the analysis showed free HCl 20, total acidity 56, blood, trace, bile and lactic acid, of each trace. Microscopically, starch, yeast, and bacteria only were found.

The patient declined any operative interference, and was allowed to go home on the afternoon of the 21st, and I suggested to his doctor that his diet should consist of all soft stuff: eggs, milk, cream, mashed potatoes, rice, carrots, canned tomato juice, orange juice, apple sauce, and cream soups.

A diagnosis of malignant disease, involving the lesser curvature of the stomach, was made, and in the course of two or three weeks I received an inquiry from a prominent insurance company concerning this patient and made a report, as I have outlined above. The case passed away from my mind, and it was not until three weeks over three years after that I was notified that my deposition would be taken in a lawsuit filed by the patient against the insurance company. In giving this deposition, I stated that I had no knowledge of any malignant disease of the stomach living that long, fully four years, as the patient had been having symptoms for at least a year

\*Read before the Louisville Medico-Chirurgical Society.



before being seen and had lost 30 pounds during that time. I gathered from the statements made at the time of giving the deposition that the patient had been able off and on to visit his place of business and, in a measure, look after his business, but I stated frankly that it was likely I had made a mistake and that he really had an old perforated ulcer, as could I not conceive of any one living that long with a malignant condition that presented the X-ray evidence and the symptoms this patient did.

Yesterday morning I received a letter from his doctor, in reply to a query of mine early in the week as to his condition, as follows:

"I regard Mr. X's case as still bad. He is able to go about some in an automobile, and be in his store some, but suffers a great deal and is not able to eat anything much."

#### DISCUSSION

**Sidney Johnson:** The patient whose history Dr. Lucas has just presented was sent to me for roentgenologic study on December 19, 1927. The routine gastrointestinal examination was made. Dr. Lucas has read to you the report which I made on the examination. I was surprised to learn from Dr. Lucas, a few weeks ago, that the patient was still alive.

There is no question as to the presence of a large filling defect of the stomach at the time of my examination. This is shown clearly in the serial roentgenograms which are before you. The stomach was not of the leather-bottle type. The fundus and pylorus were normally pliable. The defect, as you see, is in the body of the stomach, sharply defined, with rather ragged borders. During the examination the position of the patient was varied from standing to Trendelenburg. The appearance of the filling defect was not altered by changes in position of the patient. As would be expected there was no delay (and no acceleration) in emptying time of the stomach, as there was no involvement of the pylorus and duodenum.

In reconsidering the validity of the original diagnosis, it seems to me that there are two possible explanations of the fact that the patient is still alive. First, it is quite possible that the patient has a carcinoma of the stomach of slow, or even, retrogressive, development. The position of the growth is such as to interfere very little with the normal functioning of the stomach. Second, growths of benign character—tumors, syphilis, tuberculosis—must be considered. Benign tumors do not often present the ragged margins seen in this case. Syphilis is said to produce a leather-bottle type of stomach, but truly authentic cases of syphilis of the stomach in adults are so extremely rare that I would not consider it in this case even if the patient has a positive Wassermann. I have never seen a case of tuberculosis of the stomach.

In conclusion, I would like very much to ex-

amine this patient again, but until further evidence is available, I feel inclined to adhere to the original interpretation.

**Irvin Abell:** I wish to thank Dr. Lucas for his courtesy in asking me to be present this evening.

Both the man's appearance and the appearance of the x-ray plates are so characteristic of the changes we ordinarily find in malignancy, that I believe we would not be willing to affirm that the case was not one of malignancy of the stomach.

There are certain types of malignancies that occur in the stomach, particularly *linitis plastica*, which grow very slowly. I do not know whether or not the x-ray findings are compatible with this condition. In fact, there has been quite a discussion in years gone by as to whether or not the condition is malignant, so slowly does it progress due to the paucity of epithelial tissue and the abundance of fibrous tissue. I do not know that I have had under personal observation a carcinoma of the stomach with the patient living as long as this man has done.

I recently have had under observation, however, a carcinoma of the breast of long duration. This woman died during the past year. I saw her for the first time 5½ years ago, at which time she presented an ulcerated mass in the breast with palpable axillary glands and with glands above the clavicle to such an extent that we did not even regard her as suitable for x-ray or radium therapy. If that condition is possible in the breast, I think a similar condition might be possible within the stomach, although I know that ordinarily cancers in this location do not last longer than 20 or 30 months. I have seen very few benign tumors of the stomach that presented such x-ray findings as noted in this instance.

I am not willing to say that the tumor in this case is not malignant. I had rather see the end of the case before giving my consent to that view.

**Louis Frank:** I have enjoyed the report as well as the discussion. In all of the cases of *linitis plastica* that I have seen, a greater portion of the stomach has been involved than shown in the x-rays presented, and they show the typical leather bottle stomach appearance. We do not often see in cancer of the stomach such filling defects as we have in this picture. To me, I do not know of a carcinoma of the stomach that has arisen in the mid-portion which yielded such x-ray plates as have been shown. These plates show apparently perfect filling of the antrum or *pars pylorica* and the fundus of the stomach with marked constriction in the mid-portion. Such types are not uncommon in the large bowel, with cancer beginning in the deeper coats of the bowel.

I think if this were a carcinoma lasting such a long time, probably some light may have been

shed upon it by pathological examination of one of the lymph nodes above the clavicle. Usually, cases of this duration show regional metastasis. I should think this would be a very important point clinically in clearing up the case. I have seen cancer of the stomach that has gone over 3 to 4 years. I have seen cancer of the breast that has gone as long as 17 and 18 years without operation. We know that it is not so absolutely infrequent for carcinoma of the breast to travel from one portion of the breast to another until it gradually destroys it. I have seen entire breasts practically disappear under such conditions, and the individual finally die not of carcinoma but of an intercurrent disease.

Reference to this one point of supraclavicular gland involvement recalls a case that I had Dr. Morris Flexner see. I was very much concerned about this patient. She presented a mass in the abdomen, but no clinical history of cancer of the stomach.

She was anemic, and the suspicious thing was that there was noted an enlarged supraclavicular lymph node, an almost typical Virchow's node. Under local anesthesia, this node was removed for biopsy. The report came back adenocarcinoma, probably from the stomach or breast. She had nothing in the breast by clinical examination. She was treated with x-ray and radium. Her primary tumor entirely disappeared. She went along for about a year and began to lose weight. Deep x-ray therapy was again instituted. She was comfortable for about 2 years, and then she presented symptoms of obstruction and loss of weight with anemia. We opened her abdomen. At operation, which was a gastro-enterostomy, there was found a retroperitoneal tumor, causing obstruction of the pylorus by direct pressure on the duodenum. A section of the tumor mass showed the same type of cancer as found in the biopsy of the lymph node. Patient died and an autopsy was obtained, which revealed the mass in the retroperitoneum. We could not ascertain whether it was attached to the stomach or not.

In order to arrive at a final diagnosis of the case reported by Dr. Lucas, I would suggest that if the man can be induced to have local anesthesia, a supraclavicular lymph node be removed for microscopic examination.

**Morris Flexner:** There is one thing I think should be done in this case. If the patient has not had a Wassermann, he should have one. Anyone who has ever seen Eusterman's cases of syphilis of the stomach will appreciate that the condition looks very much like malignancy. For that reason, I think it should be ruled out.

The question of Virchow's gland, that Dr. Frank brought up, is important. If the man had a Virchow's gland three and a half years ago, it is probable that he would have died by now, as the disease would have spread elsewhere. The first thing to rule out is syphilis,

and if he is non-syphilitic, then it is quite possible that he may have a slowly growing type of malignancy with great resistance.

**J. Garland Sherrill:** Dr. Lucas has said that we learn by our mistakes, and if he made a mistake here, he certainly has brought forth a discussion that should prove beneficial to all of us.

Dr. Coley's work in the treatment of sarcoma and other malignant diseases began as the result of his observation in erysipelas, in a few cases attacking cancer and the cause of its disappearance.

There are many things about cancer with which we are not familiar, and the behavior of any given cancer is not according to any fixed rule. In other words, one cancer will rapidly progress to a fatal termination in a very short time. For instance, if a breast cancer is removed in a young woman a few days after development, it may recur in 6 months and the patient may be dead in a year. While on the other hand, a cancer may exist in an older person for sometime before a physician or surgeon is consulted; operation may be performed immediately, and the patient go along for many years without any recurrence.

I wish to mention a case that came under my observation 17 or more years ago. Most of us are usually able to determine carcinoma of the stomach or of the breast when we see it. This patient came in during the first stages of her severe illness, unable to eat or drink anything and retain it. She had been under the observation of a physician for two years.

When I opened her abdomen at St. Joseph's Infirmary, the condition looked like carcinoma. It involved almost two-thirds of the stomach with thick walls and marked induration. The infiltration extended into the liver as is usual in carcinoma of the stomach.

Foolishly, or perhaps wisely, I did not take out a section of the tumor for microscopic examination, and, thereby, possibly cause a spread of whatever might be present. I did a simple gastroenterostomy and quit.

The patient recovered within a few weeks and was able to eat and drink anything and retain it. I saw her at the end of 17 years, and she was doing her own housework and feeling perfectly well.

If that was not a case of cancer, I will have to say that I cannot always tell cancer when I meet it and feel it. As in this instance, when you have a prolonged freedom from symptoms following a simple operative procedure, then you can realize that a carcinoma might exist in the stomach as long as this one.

I believe as we get more and more necropsies, we will get more and more knowledge of the final outcome and final result of carcinoma in every way. This will help us along with our other studies. In fact, the result of all treat-



ment for carcinoma up to the present time has not improved much over what it was 20 or 30 years ago. There is much to be learned in this field, and if we can learn through our mistakes, I think this paper is going to be of very great benefit.

**Guy Aud:** I am very much indebted to Dr. Lucas for the privilege of attending this meeting.

These conditions are always very interesting. When Dr. Lucas told me of this case, I recalled having heard Dr. Georgine Luden read a paper on "Spontaneous Cure of Cancer." She had made a very thorough study of the literature on this subject and was able to collect, if I recall correctly, 120 cases of what were apparently spontaneous cures of cancer over very long periods of time. These were cases of extensive cancer that were proven by pathological examination. I had Dr. Luden's paper filed away so carefully that I am unable to find it. I also was unable to find her paper at the Medical Library, but in looking over the Medical Journals there, I found a number of other cases that had been reported as spontaneous cures of cancer. We have all seen cases of very extensive cancer of the stomach that have been proven so by both inspection and thorough pathological examination. I speak particularly of cases of inoperable cancer of the stomach where we have done gastroenterostomies and have such patients survive for a very long time free of symptoms. It has been my experience that they all eventually die. Nevertheless, I have had cases to go over a period of 2 or 3 years.

With your permission, I would like to call your attention to a few of the cases that I was able to find at the library, which had been reported as spontaneous cures of cancer. These are cases that have been proven by pathological examination to have had cancer. There is no question about the diagnoses.

N. P. Trinkler in the Archives of Clinical Surgery, Berlin, 1922, reports two interesting cases with very extensive carcinoma of the stomach with lymphatic involvement. Pathologically, the cases proved to be adenocarcinomas. One of these patients happened to be a woman physician, 43 years of age. She had very extensive metastasis throughout the abdominal cavity. A gastroenterostomy was done. She was perfectly well apparently at the end of seven years. There was no evidence whatever of a mass clinically, and from every clinical standpoint, he considered this woman perfectly well.

The other patient was well at the end of ten years. There was no evidence whatever of cancer, and the patient was entirely free of symptoms. Of course, the question arises as to whether or not these patients will eventually die of cancer, although they have remained entirely free from any clinical evidence, and

whether or not a post-mortem examination would reveal a cancer somewhere.

F. Erkes in the *Centralblatt für Chirurgie*, 1925, reports a case of extensive cancer of the stomach confirmed by pathological examination and entirely free from all symptoms following the operation. More than four years later, patient had a hysterectomy performed, and a particular search was made at the site of the original lesion in the stomach, which was extensive at the first operation, and not the slightest evidence of pathology could be found.

In the *British Medical Journal*, 1909, Handley reports some very interesting cases of extensive carcinoma of the breast. He reports: "One patient came to me with carcinoma of the breast, and I did an amputation of the breast. About four years later, the patient had a very extensive recurrence of the carcinoma of the breast involving the skin, axilla, chest and supraclavicular glands. No treatment was given. She returned to me sixteen years later, no treatment having been given for the recurrence, and at this time, no evidence whatever was found of the recurrence. The recurrence in the axillary glands, supraclavicular glands and the local recurrence in the skin had entirely disappeared."

Frank Godfrey reported in the *British Medical Journal* in 1910 a case of very extensive epithelioma, originating in the left tonsil. This was proven pathologically not only to involve the left tonsil but the base of the tongue, left lateral wall of the pharynx and very extensive glandular involvement in the cervical region. This man was diagnosed as being hopeless. No effort was made whatever to relieve him. He came back at the end of one year, free from any evidence of malignancy. The tissues were all perfectly soft and pliable, and the man was apparently well.

A great deal of experimental work has been done on the transplantation of cancer. Drs. Gaylord and Clowes in experimenting with rats on the transplantation of cancer have found that a rather high percentage of transplanted cancers disappear spontaneously. They reported that as high as 18 per cent or 20 per cent of transplanted cancers will disappear spontaneously provided they have not exceeded 5 mm in diameter. If the growths exceed 5 mm in diameter, only 2 per cent of them reaching the size of 1 cm in diameter have ever disappeared spontaneously. That is a different thing with which we are dealing.

Lilianthal, in the *International Journal of Surgery*, 1913, reports a rather interesting case of carcinoma of the breast involving the skin, muscles, pleura and lung, in which he said himself that he performed a very inefficient operation, in that only a very small part of the malignancy was removed, and yet this patient ap-

parently went on to a spontaneous cure and remained over a period of years.

A great many theories have been advanced as to how cancer disappears spontaneously. I was struck by one thing. In all of these cases, not a one of them had an autopsy, yet they are reported as spontaneous cures of cancer. I wonder what an autopsy would have shown.

**C. G. Lucas**, (in closing): We labored under a great disadvantage in this case. First of all, the patient was here only for about four days. During that time, he had terrific attacks of homesickness, and was scared to death of the knife. We did not take a Wassermann on him, because he would not let us draw the blood.

The mere facts that he had the enlarged gland, blood in his stomach contents, a diminished acidity, the loss of 30 pounds in weight and had been sick for a year, all in my mind pointed to a malignancy, with the x-ray report confirming it. Of course, it was very hard to examine this man. He would not relax. As I said in the report, he passed out of my mind completely.

Dr. Durrham of Columbus had a patient with carcinoma of the stomach 27 years ago, and a resection was made. The pathologist reported cancer. That man is living today. I saw him some six or seven years ago when I was in Columbus.

Dr. Abell operated upon a case for me after a diagnosis of malignancy was made. On opening the abdomen, the condition was such that nothing could be done, but the patient lived for 15 months afterward in comfort. There was something about the entrance of air into the abdomen that had something to do with helping this patient along.

Anderson, in a study of 2400 cases, showed that 17 per cent of the patients in the gastric clinic had positive Wassermans.

It is quite possible that this patient could have a positive Wassermann and still the condition may not be syphilis of the stomach.

I am perfectly willing to admit that I made a mistake. I would like to see what the autopsy is going to show.

**Effect of Insulin on Pathologic Glycogen Deposits in Diabets Mellitus**—The glycogen distribution in various tissues, particular the heart, liver, kidneys, pancreas, voluntary muscles and skin, was studied by Warren. Both insulin treated cases of diabetes and cases not treated with insulin were included. Practically every case of active diabetes treated in the preinsulin days showed glycogenic infiltration of the epithelium of Henle's loops at necropsy. Its absence in many cases treated with insulin shows that it is not an essential lesion diabetes. There is close correspondence between increase in liver cell glycogen and decrease in renal glycogen and a similar relationship between liver cell glycogen and liver nucleus glycogen.

## RUPTURE OF RECTUS ABDOMINIS MUSCLE\*

MORRIS FLEXNER, M. D.

Louisville.

Patient, female, aged 28 years, was first seen for the present illness on June 16, 1931 complaining at this time that during the course of a golf game that afternoon on two or three occasions she had noticed a sharp pain in her lower right side which had lasted for only a few minutes. There was no digestive disturbance, no nausea.

Physical examination showed a well developed, well nourished, young woman, well muscled. Examination was essentially negative except for the abdomen. In the lower right abdomen at a point slightly below McBurney's and toward the median line definite resistance was encountered and a small mass 1½-2 inches in diameter, somewhat tender, was felt. It could easily be displaced in all directions apparently.

At that particular moment I thought I was dealing with a small inflammatory mass about the appendix. The pulse was not remarkable, nor was the temperature. Dr. Wallace Frank saw her that evening and did not think the mass was an appendix and advised watching her. The next day the patient felt fine although the local condition was essentially as reported above except there was less tenderness. I went out of town for six days and was called to see the patient again on the 24th of June. On that afternoon, while playing golf, she had another sharp pain accompanied by a feeling of faintness. After resting for a few minutes, the pain became less severe and she was able to continue her match. However, toward the end of the match there was a recurrence of the pain which lasted longer but again subsided and she finished the match although somewhat handicapped. I saw her that afternoon at which time there was a definite mass 3-4 inches in diameter felt in the lower right abdomen. It seemed possible to move this mass also, although never beyond the median line, it being possible to move it up and down and somewhat to the right. The blood count made at this time by Dr. Weeter showed 13,400 white cells, 70% polymorphonuclears, 27 lymphocytes and 3 monocytes. According to the Schilling classification 61 segment, 8 staff and 1 juvenile. Dr. Frank saw her with me that evening and on first examination thought the mass was uterine but after pelvic examination felt it was likely to be an ovarian cyst with a slight twist. Operation was decided for the next morning and Dr. Frank's op-

\*Read before the Louisville Medico-Chirurgical Society.



erative note as follows:

Operation: As the incision was made, it was noticed that there was some blood just beneath the fascia and further investigation showed a hematoma in the right rectus muscle. Separation of the peritoneum from the preperitoneal fascia revealed no evidence of bleeding from the deeper vessels. Skin was then dissected away from the fascia of the right rectus muscle and fascia over the hematoma was incised for a distance of an inch. About two inches of dark blood with some clots were evacuated and it was found that there was a definite tear in the fibers of the right rectus muscle. This was repaired with three catgut sutures in the muscle. Incision in the fascia was then closed. Wound closed in layers, 2 s. w. g.

This case is reported for two reasons: first, because of the mistakes in diagnosis and secondly because of the rarity of the condition. This young lady is an excellent tennis player, one of the best golf players in the city and a general all-round athlete, well developed. Spontaneous rupture of the rectus muscle in that type of individual during a golf game must be a very rare occurrence.

#### DISCUSSION

**Wallace Frank:** As Dr. Flexner has said, I did see this girl in her first attack of pain, but I could not make out any mass at that time. She had some tenderness in the right iliac fossa, but it was to the inside of the appendiceal region.

A week later, when I saw her again with Dr. Flexner, she did have a very definite mass. I still thought it was to the inner side of the normal site of the appendix. On first palpating the abdomen, I thought the girl might have a fibroid of the uterus, although I had seen her two or three years previously, and there were no fibroids present at that time. On doing a pelvic examination, as you raised the uterus and ovary up, you could feel the ovary, and this mass seemed connected with the tail-end of the ovary. Having seen par-ovarian cysts that were partly twisted, my idea was if she had anything it was possibly a twisted ovarian cyst. The possibility of a ruptured rectus muscle had not entered into my consideration, although at the time of the operation, when we started to make the incision, Dr. Louis Frank remarked that it might be a tear in the rectus muscle.

**Morris Flexner,** (in closing): I would like to say that to me the mass felt absolutely as if it were in the peritoneal cavity. She did not have a great deal of pain with the first attack. The tear must have started with very few muscular fibers, and then at a subsequent golf game, she completed it.

I thought this condition was sufficiently interesting to report, in that a strong husky girl

ruptured the rectus muscle on striking at a golf ball.

#### PERTHES' DISEASE, CASE REPORT\*

ORVILLE R. MILLER, M. D.

Louisville.

R. P., white male, aged eight years, well developed and well nourished.

**Personal History:** General health has been good throughout his life, there having been no serious illnesses. In February, 1928, patient had an injury to his left hip; was taken to his family doctor, who found no evidence of bone injury but applied a plaster spica in September 1928. The patient wore a plaster at intervals until May 29, 1930, when he came under my observation.

Examination of May 29, 1930 showed a well nourished, well developed boy, mentally alert, without evidence at a casual glance, of any disease or disability of any kind, other than a very mild hip limp on the left side. There was no evidence of infection of the throat or mouth; chest negative; abdominal viscera apparently normal; no evidence of genito-urinary disturbance; muscles and reflexes were present everywhere and normal; there were no sensitive spots found anywhere on the body except over the left hip; motion in all of the joints of the body was free and painless, except for slight pain in the left hip and limitation of abduction and rotation of the left thigh; measurements of the lower extremities showed about one-quarter of an inch shortening on the left side. Wassermann was negative. Urinalysis negative.

Ex-ray examination showed marked thickening of the neck of the left femur with irregularity and flattening of the head of the femur, apparently a case of Perthes' Disease. No other abnormalities seen. Plaster of Paris spica was applied, with the leg held in abduction and the knee in extension with the foot at a right angle to the leg. These spicas were removed and re-applied at intervals of every six weeks, until the patient was dismissed from the Hospital on October 11th, wearing a plaster, with instructions to return after six weeks had passed. The patient had begun to experience considerable pain, of an aching nature, in his left hip during the time he was in the hospital and it was considered advisable for him to return to the country for a while.

Patient was re-admitted to the hospital on December 5, 1930. Patient stated that while at home he had experienced considerable pain in the left hip and in the left knee. A tuberculin test was done, which was negative. The x-ray at this time showed typical

\*Read before the Jefferson County Medical Society.

Perthes' Disease with fragmentation of the epiphysis and beginning migration of the epiphysis toward the trochanter.

On December 30, 1930, patient was taken to the operating room and a general anesthetic administered. An "U" shaped incision was made around the greater trochanter of the left hip so that a flap could be reflected upward. After the skin and fascia were divided, the greater trochanter was chipped off with a chisel and with its muscular attachments intact, was reflected upward with muscles, superficial fascia and skin. The hip joint was thus exposed, the capsule was opened and the femur disarticulated. The articular cartilage was decidedly flattened and the head presented an appearance of having had a severe blow. The epiphysis was removed with a chisel, being severed through the epiphyseal line. The neck of the femur was then smoothed and rounded by means of a bone rasp, and, fitted into the acetabulum. The joint cavity was freed of hemorrhage and blood clots and the capsule sutured with No. 2 Chromic catgut. The trochanter was displaced downward on the shaft of the femur as far as possible and sutured to the periosteum of the shaft with kangaroo tendon. The fascia and muscles were approximated and the skin closed with dermal suture. The hip was immobilized in a previously prepared, bi-valved hip spica to maintain a position of abduction of the thigh; extension of the knee and to hold the foot at a right angle to the leg.

During the next ten days, patients' temperature ranged from 99.4° F., to 102.8° F., but subsequently returned very rapidly to normal.

On January 18, 1931, the plaster was removed and passive motion instituted in the hip and knee joints. This was continued daily. On February 10th, patient was allowed to be up in a wheel chair. About April 20th, patient was provided with crutches and allowed to get up and walk about, and instructed to do setting up exercises. The exercises were continued twice daily until the patient was discharged from the hospital on June 16, 1931, with limitation of rotation, limitation of flexion in the left hip, but without pain. The patient was able to walk without crutches but there was some stiffness about the left hip that caused a limp on that side. The left shoe was raised three-quarters of an inch.

On October 9, 1931, at examination, it was found that the patient still has about three-quarters of an inch shortening of the left lower extremity but that there is almost complete range of motion in the hip that is obstructed and unattended by pain and the patient has not complained of pain since

discharge from the hospital. The operation performed on this patient was a typical Whitman reconstruction operation which has been advocated in Perthes' Disease if the patient suffers pain or other disability that is severe enough to warrant such an operation.

The result in this particular case thus far, has been all that could be hoped for.

#### DISCUSSION

**Frank P. Strickler, Louisville:** I think that Dr. Miller's case should be discussed. We are seeing more and more cases of Perthes' disease. These cases are not always easy to differentiate from tuberculosis of the hip joint.

Very few cases of Perthes' disease are operated on as a rule, but at times operation is certainly indicated.

Usually putting the hip joint absolutely at rest and removing the weight from the joint will give the patient relief. They should also be placed on Super "D" Cod Liver Oil, high calcium feeding with large amounts of milk, fresh air and sunshine.

The cause of Perthes' disease is not definitely known. The prognosis is usually favorable and good results can be obtained with proper treatment.

**Orville Miller, (in closing):** I have nothing further to say except this: That this type of case may possibly have been what at one time was considered caries sicca, or dry tuberculosis, by some of the old text books. This condition is described as a tuberculous lesion of the hip in which there is no breaking down of bone structures to produce an abscess. In all probability these cases were what was later described by Perthes in 1910, and is now known as Perthes' Disease. Only the "mushroom" or "Tam-o'-Shanter" type should be operated upon by this method, or at least that is the belief at the present time.

#### FORUM

Louisville, Ky., March 15th, 1932.

To the Editor:

"In the March issue of the Journal under discussions, I stated my objections to the use of Amytal and Sodium Amytal were that it was not an accepted preparation and as such its danger was obvious etc. My attention was called to this by an Insurance Adjuster who told of a suit against a doctor for its use, hence my error. I have been apprised by the Eli Lilly Co. that same was accepted some months previous and that I am in error in the above statement so hope you will correct the error with proper note and make clear to the profession that both remedies are now accepted and without any objections from that score."

Trusting this will receive your attention and due corrections be made

I remain yours,

A. D. WILLMOTH, M. D.



TORSION OF A NORMAL OVARY AND  
TUBE WITH RUPTURE OF THE  
OVARY AND A REVIEW OF  
ALL THE LITERATURE  
TO DATE: AN  
ADDENDUM\*

CHARLES BARON, M. D.

Covington.

Since the original paper was read\*, further research of the literature has revealed considerably more data. Therefore in order to make the entire paper a conclusive one, this additional report is deemed necessary.

While it was stated that the condition is relatively rare, yet it is felt from a study of the literature that it is more common than supposed. Michon (1) is of the same belief. In reviewing the literature, it was surprising to see the paucity of previously reported cases by the authors, and this only stresses the fact that no search can be too thorough. And it is in a spirit of recognizing the fact that "to err is human," let it be said that it is altogether probable that additional cases have been overlooked in this paper.

Torsion of the normal ovary with and without the normal fallopian tube in its normal position, is dealt with here. The following is a summary of all cases to date.

The first ever reported was by Hartman (2) in 1898. The youngest patient ever reported was four months old, by Rost (2). It was interesting to note that of such a rare type of surgical abdomen, four men, Norris, (2), Munroe (2), Michon (1), and Poll (3), reported two cases each. Poll strangely enough, occurred in sisters.

The only previous case on record of rupture following torsion, is that reported by Stein (4). Here, the rupture was complete and in Stein's own term was called a complete "fracture" in two of the ovary. Our case (12) makes the second twisted ruptured ovary reported.

Those cases in which the normal ovary was involved alone total fourteen. They have been reported by Norris, two cases (2), Barrington (2), Johnson (2), Rost (2), Bauer (2), Cohen (5), Poll, two cases (3), Kraul (6), Stein (4), Wachtel (7), Mankad (8), and Bernard (2). The last one mentioned occurred during pregnancy. Mankad's case was discovered when a right cystic ovary, correctly diagnosed, was removed. Upon inspection of the left ovary, it was found to be normal but twisted, buried in adhesions.

Those cases in which the normal ovary was twisted with the normal tube total twelve. They have been reported by Michon, two cases (1), Auvray (2), Cassidy and Norbury (2), Neugrbauer (9), Munroe, two cases (2), Heil (10), Downer and Brine (11), Northcutt and Bargh (12), Aulhorn (2), and Hartmann (2). The last two mentioned occurred also in pregnancy.

#### CONCLUSIONS

1. Twenty-six cases of torsion of the normal ovary have been reported in the literature. Of these, fourteen involved the ovary alone, and in twelve, the ovary and tube were both involved.

2. Two cases are on record in which rupture of the ovary followed the torsion.

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#### BOOK REVIEWS

**SCHOOL NURSING**—By Mary Ella Chayer, R. N., B. S., 2 West 45th Street, New York City: G. P. Putman's Sons, 1931. \$2.50.

School Nursing, written primarily for the school nurse in elementary and secondary schools, deals with the contribution of the nurse to a healthful school environment, including the hygiene of instruction, the control of contagion, and facilities for first aid and safety.

The county health officer may also find this book interesting because of the carefully defined place of the nurse with respect to the health education program. Valuable suggestions are made throughout the book for a health program in the rural field for teachers.

**THE NURSES MEDICAL LEXICON**—By Thomas Lathrop Stedman, A. M., M. D., New York City: William Wood and Company, 156 Fifth Avenue, 1931. \$2.00.

For the use of graduate and student nurses, of premedical and dental students, and of the general public.

\*The original paper was read before the Campbell-Kenton County Medical Society, June 1, 1931 and subsequently read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

# Kentucky Medical Journal

Published Monthly By

THE KENTUCKY MEDICAL ASSOCIATION  
Incorporated

Entered as second class matter October 22, 1906, at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price .....\$5.00  
Edited Under Supervision of the Council

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NEXT MEETING LOUISVILLE

## COUNTY SOCIETY REPORTS

**Jefferson:** The April program of the Jefferson County Medical Society will be as follows:

### April 4th—Case Reports

Three Different Kinds of Tumors in the Same Pelvis, J. G. Sherrill, M. D.

Lead Poisoning in an Infant, James W. Bruce, M. D.

### Essay

The Premature Infant, T. Cook Smith, M. D.

Discussion to be opened by Drs. James H. Pritchett and Henry M. Rubel.

### April 18th—Case Reports

Aerophagia in a Child, A. A. Shapero, M. D.

### Symposium on Disease of the Ear and Some Complications

1. The Ear in Acute Disease, A. L. Bass, M. D.

2. Mastoiditis from the Standpoint of the General Physician, Walter Dean, M. D.

3. Etiology and Diagnosis of Intracranial Complications of Diseases of the Ear and Mastoid, Gaylord C. Hall, M. D.

4. Treatment of Intracranial Complications of Diseases of the Ear and Mastoid, Franklin Jelsma, M. D.

Discussion to be opened Drs. S. G. Dabney and Will R. Pryor.

GUY AUD, President,

ULY H. SMITH, Secretary.

**Bourbon:** The Bourbon County Society met on Thursday, February 18, 1932, at 8:00 p. m. The meeting was held in the County Court Room of the Court House.

Members of the society present: Drs. J. C. Hart, J. A. Orr, J. M. Boxley, W. B. Hopkins, Wm. Kenney, C. G. Daugherty, R. M. Blemker and M. J. Stern.

Visitors: Dr. W. N. Liscomb, Lexington.

The minutes of the January meeting were read. Drs. J. C. Hart, W. B. Hopkins, C. G. Daugherty, Wm. Kenney, R. M. Blemker paid dues for 1932.

Dr. W. N. Lipscomb read a paper on "Differential Diagnosis of So-called Indigestion." The discussion was opened by Dr. Boxley, followed by Drs. Daugherty, Kenney, Blemker, Orr, and Stern. The discussion was closed by Dr. Lipscomb.

M. J. STERN, Secretary.

**Franklin:** The Society met in regular monthly session Thursday, February 4th at 5:30 p. m. in the Rotary Room of the Capital Hotel.

Dr. G. H. Heilman, the president, presided. The Society moved to omit the reading of the minutes of the previous meeting in order to give the full time to the speaker, Dr. Jethra Hancock of Louisville, who gave a most interesting talk on "Prenatal Syphilis." The subject was generally discussed by most members and visitors present.



Following the meeting, the physicians connected with the General Assembly and visitors were entertained at a dinner in the Hotel Dining Room by the Society. Members present were: Drs. Ginn, Heilman, Minish, Darnell, Lyon, Travis, Patterson, Coleman, Jackson and Youmans.

The names of Drs. Griffey and Snyder were presented to the Society for membership. The censors to report at the next meeting in March.

C. E. YOUMANS Secretary.

**Grant:** The Grant County Medical Society had its regular monthly meeting, Feb. 17, 1932 at the Grant County Health Department, with Drs. N. H. Ellis, J. W. Abernathy, A. D. Blaine and C. A. Eckler, present.

Communications were read and approved and the communication of the Jefferson County Medical Society regarding the amendment to the Workman's Compensation Law was unanimously indorsed by our Society and letters were ordered written to J. C. B. Conrad, our Representative, also one to Senator Littrell, urging them to vote for the measure.

Case reports was now called for and Dr. A. D. Blaine responded, reporting an interesting case of Infantile Paralysis. Numerous and interesting cases were discussed, also some very interesting cases of Cerebro-Spinal Meningitis were reported by Dr. Blaine. Dr. Blaine reported a case of Infantile Paralysis in a one-room house where there were a number of children but no other case developed. Dr. Eckler reported a complete fracture of the Tibia and Fibula in a child of three years.

Dr. N. H. Ellis, our Health Officer, read some sanitary regulations in reference to sanitary toilets in our towns which was indorsed by our society as a great stride in the sanitary welfare of our County.

Dr. Blaine reported a case of Typhoid Fever in a child six years of age.

Our subject for the evening, "Injuries and Deformities in the New Born Babe" was now taken up. This subject was discussed mainly by cases of personal experience.

Dr. J. W. Abernathy was first to take the subject up and reported a splendid well developed new born babe in apparently the best of health that died suddenly the next day, cause unknown.

Numerous cases of Hydrocephalus, Spina-Bifida, Cerebral Hemorrhage, Deformed Syphilitics, Hairlips, Fractured Humerus, Congenital Heart Disease, Icterus and blue and white babies. The talks were very interesting.

Topic for next meeting, "Influenza and Complications." Dr. J. L. Price to open the discussion.

Dues collected, Dr. A. D. Blaine, \$5.00.

There being nothing further we adjourned to

meet the third Wednesday in March at 7:30 p. m.  
E. A. ECKLER, Secretary.

**Franklin:** The meeting of the Franklin County Medical Society was held Thursday, March 3rd, in the Capital Hotel at 12 o'clock, noon.

Members present were: Drs. Minish, Jackson, Ginn, Coblin, Coleman and Youmans. Minutes of the last meeting were read and adopted. Due to the absence of Dr. Hailman, who had charge of the program, and several other members, there was but little business transacted. The Society was very much pleased to welcome Drs. Snyder, Griffey and Martin as members to this Society.

No other business, the Society then adjourned to the Hotel Dining Room for lunch.

C. E. YOUMANS Secretary.

**Wayne:** On January 25, 1932 a meeting of the Wayne County Medical Society was called at the office of the Rice Hospital.

The following officers were elected for 1932:

E. B. Rice, Monticello, President.

C. F. Holtegle, Monticello, Vice-President.

R. E. Teague, Monticello, Secretary-Treasurer.

R. E. TEAGUE, Secretary.

**Muhlenberg:** At the meeting of the Muhlenberg County Medical Society the following resolution was read:

On February 5th the spirit departed from the temporal body of Dr. Jefferson Davis Cundiff, aged 69 years, 2 months and 5 days, at Drakesboro, near which place he was born, and at which he had lived practically all his life.

Doctor Cundiff received his preliminary education at the county schools. He took his course of medical lectures at Louisville Medical College from which he graduated in 1889.

In 1892 he was married to Miss Ida Crow. No children were born to this union.

The Doctor was a member of the Missionary Baptist Church. The body was consigned to its last resting place in the Greenville cemetery.

Dr. Cundiff was a faithful member of his county and state medical association and he was well beloved by all his confreres.

The Society mourns his loss and extends to his bereaved family, sympathy and consolation.

ROY ORSBURN, Secretary.

**Perry:** The monthly meeting of the Perry County Medical Society was held in the library of the Hazard High School on Monday evening, February 8th.

The following members attended the meeting: Dr. J. S. Gilbert, Dr. J. C. Coldiron, Dr. H. W. Gingles, Dr. H. L. Tutwiler, Dr. J. K. Stoddard, Dr. Kooser, Dr. N. G. Riggins, Dr. J. E. Hagan, Dr. C. D. Snyder, Dr. S. B. Snyder, Dr. J. M. Ray, Dr. J. P. Boggs, Dr. R. L. Collins, Dr. B. M. Brown, Dr. Taylor Hurst, Dr. Martin Pal-

mer, and Dr. F. W. Caudill.

The meeting was presided over by Dr. H. W. Nyce, the newly elected president. Dr. F. W. Forge, Assistant Director of the Bureau of County Health work, State Board of Health, Louisville, was a visitor at the meeting. Dr. C. R. Borgardus, newly elected Director of the Leslie County Health Department, was taken in as an associate member until his credentials could be certified and his license registered locally, when he will become an active member. The doctors from Leslie and Knott meet with and as a part of the Perry County Society because of the sparsity of practitioners in each of these two counties making it impossible for either of them to carry on an organized society of their own.

After the transaction of the routine business two well prepared papers were read. Dr. J. C. Coldiron of Hazard, delivered an excellent essay on the etiology, symptoms and treatment of "Gastric Ulcer." Dr. R. L. Collins began a discussion of this subject which was enthusiastically participated in by nearly every member present.

Following Dr. Coldiron's paper, Dr. H. W. Gingles, of Harburbury, read a concise but very comprehensible paper on "Common Heart Conditions." The discussion of this paper was led by Dr. S. B. Snyder, during which different phases of the more prevalent heart conditions were brought out. This paper was so enthusiastically received that it was proposed and passed by the Society that the essayist allow the paper to be published in one of the coming issues of the Journal of the Kentucky State Medical Association. Dr. Gingles kindly acquiesced to this request and we hope to see it in print in the Journal within the next few months.

After the regular program was finished the meeting adjourned to the main auditorium of the Hazard High School, where the members enjoyed a moving picture on the technique of "Spinal Anesthesia." The films for this demonstration were lent by the H. A. Metz Laboratories of New York. The facilities of the High School were kindly made available for the meeting and motion picture demonstration by Mr. J. Foley Snyder, the principal.

F. W. CAUDILL, Secretary.

### BOOK REVIEWS

**GYNECOLOGY AND UROLOGY FOR NURSES.**—By Samuel S. Rosenfield, M. D., F. A. C. S. 156 Fifth Avenue, New York City: William Wood & Company, 1931. \$6.00, net.

The author states, "in the writing of this book, I have above all attempted to emphasize that the nurse most needs to know in order to be able to attend her patients intelligently.

There are many good books on obstetrics

for nurses and I therefore decided not to combine this book with obstetrics. I have, however, attempted to show that obstetrics and gynecology are allied subjects."

Physicians who teach nurses may find the book very useful. Nurses will also find it interesting and helpful.

**A TEXT-BOOK OF HISTOLOGY.** By Alexander A. Maximow, Late Professor of Anatomy, University of Chicago. Completed and Edited by William Bloom, Assistant Professor of Anatomy, University of Chicago. 833 pages with 604 illustrations, some in colors. Philadelphia and London: W. B. Saunders Company, 1930. Cloth, \$9.00.

Here is a new text-book that presents histology from its living, functioning, and human aspects. The minute structure is correlated with its function; for instance, you are told not only that a certain organ performs a certain function, but which cells of that organ are responsible for each phase of its function—and by what mechanism.

Professor Maximow's book departs from the the old order and presents histology as a living subject. At all times emphasis is on the study of adult tissue, giving histogenetic data only when they will aid in the understanding of the mature tissue or organ.

There are 604 striking histologic portraits! Not diagrams, but portraits of living material that will enable you to recognize the structure when you view it under the microscope. The proportions are accurate, the tones are life-like, and many show the relationship of cells in three dimensions. Professor Maximow's drawings have been reproduced and printed with all the beauty and detail of the originals.

**COURTS AND DOCTORS**—By Lloyd Paul Stryker. The MacMillan Company, Publishers, New York. Price \$2.00.

In this book the author, for many years general counsel for the Medical Society for the State of New York and having personal charge of legal policy of the Society and the defense of its members, who were sued for malpractice, offers advice and counsel that will be instrumental in protecting the doctors against unwarranted attack upon their professional character. Mr. Stryker is exceptionally qualified to write this book by reason of his long experience as a trial counsel and his handling for many years of medico-legal problems, both in trial and appellate courts as well as before committees of the legislature.



# KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. 30 No. 5

BOWLING GREEN, KY.,

MAY, 1932

## THE NEXT ANNUAL MEETING

Preparations are rapidly taking concrete shape for the Eighty-Second Annual Meeting of the Kentucky State Medical Association, which will convene at the Brown Hotel, Louisville, October 3rd-6th.

The program committee, composed of Dr. Orville Miller, chairman and Dr. Philip F. Barbour and Dr. A. T. McCormack, ex-officio, has practically completed its work. This program in its entirety is expected to be ready for publication in the June issue of the JOURNAL. The composition of the committee is in itself an assurance that the program, when presented, will be interesting, comprehensive and altogether worth while.

## THE POST GRADUATE COURSE

The Summer Post Graduate Course, under the joint auspices of the Kentucky State Medical Association and the Medical Department of the University of Louisville, has been so arranged this year that those attending the Alumni Meeting of the University of Louisville School of Medicine will also have opportunity to avail themselves of the Post Graduate Course.

The many duties of Dr. Philip F. Barbour as President-Elect of the Association have increased his work to an extent rendering it necessary for him to delegate conduct of this Post Graduate School to Charles W. Hibbitt, M. D., John Walker Moore, M. D. and J. R. Wathen, M. D. These have each had four years experience in connection with the School, and the course this year promises to rival any of the preceding courses in its practicability and its adaptation to the needs of the general practitioner. Special attention will be given to those interested in surgery.

Reduced rates may be secured at all the leading hotels and all the hospitals will be open to physicians for inspection and otherwise.

In the way of amusements and recreation, Louisville, this year offers, in addition to a variety of first class moving picture houses, a stock company whose repertoire will include all the latest Broadway hits at popular prices. Three public swimming pools will be open and visitor's cards may be secured from any of the physicians for the various golf courses. Visitors will be wel-

come at the Laboratory of the State Board of Health at all times and the offices of the JOURNAL may be used as headquarters for mail, rest and general information.

For further particulars write to the Chairman, Dr. C. W. Hibbitt, Louisville.

## THE NEW ORLEANS SESSION OF THE AMERICAN MEDICAL ASSOCIATION

The program of the New Orleans Session of the American Medical Association will include contributions by several distinguished guests from foreign countries. Dr. P. Wolff, Secretary of the Narcotic Committee of the League of Nations, Secretary of the German Council of Therapy, and editor of the leading medical publication of Germany will participate in the Clinical Lecture Program on Monday, May 9. His topic will be "Drug Addiction—A World Wide Problem." Dr. W. L. Treadway, U. S. Public Health Service, will discuss "Drug Addiction in the United States."

Sir Arthur Newshome, of Birmingham, England, whose lifetime labors in the field of public health have made his name known the world over, will be one of the participants in a joint symposium of the Section on Practice of Medicine and the Section on Preventive and Industrial Medicine and Public Health. Sir Arthur's topic will be "The Relation of Private Practice to Preventive Medicine in Europe."

Prof. N. Krasnogorski, of Leningrad, will contribute a paper on "Conditional Reflexes in Psychopathology of Childhood" to the program of the Section on Diseases of Children.

The opening general meeting, at which Dr. E. H. Cary will be installed as President, will be at the Auditorium on Tuesday evening May 10th.

The President's Reception will be on Thursday evening, May 12th.

The meetings of the Scientific Sections will begin on Wednesday morning, May 11th, and will continue through Friday, May 13th.

The House of Delegates will convene for its first meeting at 10:00 a. m., Monday, May 9th. All meetings of the House of Delegates will be held at the Roosevelt Hotel.

The Local Committee on Arrangements, of which Dr. W. H. Seemann, 837 Gravier St., New Orleans, is Chairman, has been engaged

in perfecting all necessary arrangements for the Session and in maturing plans for promoting the comfort and convenience of those in attendance.

The meetings of the Woman's Auxiliary will be held at the Hotel Bienville.

Those expecting to attend the New Orleans Session and have not made hotel reservations, should do so at once. Requests for reservations may be sent to Dr. Emmett L. Irwin, Chairman of the Committee on Hotels, Box 1460, New Orleans.

### FLY TO NEW ORLEANS

The American Airways operates a plane schedule, with one plane each way daily, to Louisville and New Orleans. The south-bound plane leaves Louisville at 10:26 a. m., arriving in New Orleans at 5:50 p. m.; the north-bound plane leaves New Orleans at 8:25 a. m., arriving in Louisville at 3:35 p. m. The one-way fare is \$46.50; round trip is \$83.87.

The Curtis-Wright Flying Service have planes for special charter. Five doctors desiring to make the trip by air can secure a special plane at \$90.00 each for the round trip.

Many advantages attach to going in a special plane. The first is, the privacy thus assured; the second lies in not having to meet a specific schedule. In a special plane, you may leave Louisville or New Orleans at your own convenience; whereas, on established lines, you have to travel according to fixed schedule and if the plane should be held up for any reason at any schedule point, it means holding you up also.

For further information in regard to special plane service, write to J. C. Bennett, Manager, Curtis-Wright Flying Service, Louisville, Kentucky.

### AMERICAN MEDICAL GOLFERS PLAY IN NEW ORLEANS, MAY 9th

The American Medical Golfing Association will hold its Eighteenth Annual Tournament in New Orleans on Monday, May 9, 1932. The thirty-six hole match will be played over the beautiful and interesting New Orleans Country Club course, followed in the evening by the golfers' banquet and distribution of prizes. Approximately fifty trophies and prizes will be distributed to winners in the various events.

The membership of the A. M. G. A. now totals 850 physicians, representing every state in the union. It is anticipated that

150 medical golfers will be attracted to New Orleans for this year's tournament.

Dr. Frank A. Kelly of Detroit is President of the American medical golfers, Dr. Homer K. Nicoll, of Chicago is First Vice-President, and Dr. John Welsh Croskey of Philadelphia is Second Vice-President. The Local Committee in charge of arrangements at New Orleans is composed of Dr. J. P. O'Kelley, Chairman, Drs. L. R. DeBuys, Lucian A. Fortier, Val H. Fuchs, J. P. Leake, W. W. Leake, Louis Levy, Walter E. Levy, J. T. O'Ferrall, D. N. Silverman and Arthur I. Weil.

Fixed competition for 36 holes includes low gross, low net, choice score handicap, and kickers' handicap. Eighteen hole events include low gross, low net, maturity (limited to fellows over sixty years of age), and the "oldguard," (limited to competition of past presidents). The Mayor of the host city is always invited to present the trophy for kickers' handicap.

Invitations to attend the American Medical Golfing Association tournament in New Orleans are being sent to members from the Executive Office in Detroit. Any male fellow of the American Medical Association in good standing is eligible to membership in the Golfing Association. Physicians are invited to become associated with this active social organization which offers much in good sportsmanship and friendship.

Applications may be procured by writing Bill Burns, Executive Secretary, 4421 Woodward Avenue, Detroit, Michigan.

### RAILROAD FACILITIES TO NEW ORLEANS

In the advertising pages of the JOURNAL will be found an advertisement concerning railroad facilities to New Orleans for the A. M. A. There are many through train services to the Crescent City, comfortable Pullmans and excellent dining cars, that those who have to consider time as a factor as well as expense, may use this method of transportation to an advantage.

Dr. L. H. South, Louisville, has been appointed chairman of transportation and will make all reservations, supply time tables and any other information and will in every way to relieve all annoyances connected with the phase of the journey. If sufficient number of reservations can be obtained a Kentucky Special will be secured,



THE KENTUCKY STATE MEDICAL  
ASSOCIATION SUMMER POST  
GRADUATE COURSE

GENERAL PROGRAM  
City Hospital—Louisville  
June 6-18, 1932

The following out-of-town graduates of University of Louisville School of Medicine, who are also connected with the City Hospital, will address visitors and the local profession Monday, June 6th, beginning at 9:00 A. M.

David Polowe, M. D., Paterson, N. J.—The Specific Gravity of the Blood in Pregnancy and in the Puerperium. Lantern Slides.

Jack Henry, M. D., University of Tennessee, Memphis, Tenn.—Allergy: In Theory and Practice.

A. V. Griswold, M. D., Cleveland, O.—The Surgical Treatment of Adhesive Pericarditis. Lantern Slides.

C. N. Kavanaugh, M. D., Lexington—Tn-laremia with Report of 120 Cases. Lantern Slides.

M. G. Seibel, M. D., Washington University, St. Louis, Mo.—Tumors of the Islands of Langerhans and Hypoglycemia. Lantern Slides.

Harry Beckman, M. D., University of Marquette, Milwaukee, Wis.—A Note on the Acid Treatment of Hay Fever. Lantern Slides.

V. V. Anderson, M. D., New York City—Recent Developments in Psychiatry.

Otho C. Hudson, M. D., Brooklyn, N. Y.—Nicola Operation for Recurrent Dislocation of the Shoulder. Lantern Slides.

F. P. Helm, M. D., Miami, Okla.—Treatment of Sporotrichosis. Lantern Slides.

Ermia L. Ray, M. D., New York City—Subject to be announced later.

Registration Fee—\$2.00.

	Monday June 6th	Tuesday June 7th	Wednesday June 8th	Thursday June 9th	Friday June 10th	Saturday June 11th
8-9	LABORATORY					
9-10			Goitre Wathen	Tubercu- losis Miller	Urology Grant	Modern Treatment of Varicose Veins Out-Pa- tient De- partment Armstrong
10-11	PROGRAM ABOVE	COMMENCEMENT EXERCISES—U. of L.	Gall Bladder E. S. Allen	Pneumonia Symposium (Kinsman (Leavell (Johnson	Cancer of the Uterus (Price (Lukins (Grishy	Orthopedics Owen & Woodward
11-12			Peritonitis Sherrill	Empyema W. Frank	Obstetric Symposium Speidel	Proctology Asman
12-1			Breast Tumors Abell	Internal Medicine Simpson	McConnell	Cancer Frank
LUNCH						
2-3		State Board of Health	Eye Pfingst	Skin Young	Prenatal Clinic Pickett Starr	
3-4			Acute Intestinal Obstruction Hendon	X-ray Bell	Ear, Nose and Throat Dean	

	Monday June 13th	Tuesday June 14th	Wednesday June 15th	Thursday June 16th	Friday June 17th	Saturday June 18th
8-9	LABORATORY					
	Pediatric Wards  Smith & Andrews	Heart Ward Rounds  Moore & Frankel	Cystoscopic Demonstra- tion  Stites	Blood Transfusion  Stickler	Urology  Grant	Nerve Surgery  Zimmerman
	Scarlet Fever Immunity  J. D. Allen	Heart	TRIP TO WAVERLY HILL SANATORIUM AND DINNER	Gynecology  Hibbitt Davidson Fallis	Orthopedics  Miller	Brain Surgery  Spurling & Jelsma
	Pediatric Clinic  Barbour	Internal Medicine  Simpson		Emergency and Indus- trial Sur- gery  Bloch	Medicine  Dowden	Pathology  Miller
	Contagious Diseases  Pritchett	Psychiatry  Gardner		Appendi- citis  Aud	Medicine  Flexner	Delivery of Diplomas  Barbour
	Infant Feeding  J. Bruce	Eye  Wolfe		Salvarsan  Young & Staff	Sinus Diseases  Bass	
	Anesthesia  Long	Nervous Diseases  Moren		Radium  Keith	Diets Stomach  Lucas	

## DISPENSARY CLINIC

Medicine, Surgery, Pediatrics and Gynecology—Daily: 10-12.

Genito-Urinary—Daily: 1-2.

Prenatal Clinic—Wednesday and Friday: 1-3.



## SCIENTIFIC EDITORIAL

## DIABETIC COMA

In diabetic cases treatment should always be begun immediately when the first signs of coma develop, as delay may so easily result in irreparable damage to the control centers of the respiratory and circulatory system. The patient should be kept quiet. The excess sugar in the blood should be metabolized to bring about a destruction of the poisonous fatty acids, and large quantities of fluid should be administered to effect rapid elimination of the end products of these acids.

The most important thing to be considered is to treat each case individually and to give enough Insulin to metabolize this high blood sugar regardless of how large the quantity may be. In one case that is a striking example of the large doses required, I was called out of the city and saw this patient for the first time at 11 o'clock at night, several hours after the development of the coma. I gave him at once 50 units of Insulin subcutaneously and instituted continuous hypodermoclysis. In two hours the urine was tested and showed a high percentage of sugar. I then gave him 100 units. In another two hours there had apparently been no impression made on the high glycosuria so I then gave him 100 units subcutaneously and 100 units intravenously. This dosage was continued at two hour intervals until there was a lessening of the sugar in the urine, and then smaller doses were used, watching the urine carefully. The next morning the condition was greatly improved, and the patient could be removed to Louisville in an ambulance. This case received in all 1030 units of Insulin between eleven o'clock at night and ten o'clock the next morning and if this heroic treatment had not been given, I am quite certain he would not have recovered.

Blood sugar determinations are a great advantage, but could not be used in this case owing to absence of facilities, but with frequent urine examinations as a guide and sufficient experience, it is reasonably easy to determine how much Insulin should be given. The question of changing a diabetic coma into a Insulin coma deserves very little consideration, as this differentiation is very simple. The diabetic coma is a desperate fatal condition unless treated properly, and the Insulin coma can be corrected at once by the injection of glucose into the vein, if necessary.

R. HAYS DAVIS.

## METALIZED MILK FOR ANEMIA

Every physician in Kentucky, we are confident, will be interested in the investigations of Professor Hart and his associates at the Wisconsin Agricultural Experiment Station in connection with metalizing milk by the addition of iron. These investigations seem to have demonstrated that when milk is reinforced with iron and a slight trace of copper, the iron is assimilated into the blood. Iron added to milk, which is naturally deficient in this metal, is not assimilated without the addition of a slight trace of copper. Metalized milk was first used to control anemia in animals, such as thumps in pigs. Later it was found valuable in the hemoglobin content of the blood of young children, whose diet was largely milk, and also in certain cases of idiopathic anemia in adults. This, of course, does not apply to pernicious anemia.

The metalized milk is prepared by simply putting a stick of metal containing cobalt, copper, iron and manganese into a bottle of milk and keeping it there for twelve hours. Within this period sufficient of the metal is absorbed to make it effective. The milk so treated should be consumed at the end of twelve-hour period, as the metal absorbed increases the rate of spoilage.

Dr. J. L. McGhee, of Emory University, reports administering from a pint to a quart of metalized milk a day to each of one hundred and forty cases suffering from anemia. For the entire group receiving this treatment the count of red blood corpuscles was increased fifteen per cent. The physician trying this experiment and not having at his disposal a technician who can do the blood count can readily resort to the Talquest hemoglobin pad. This is very inexpensive and fairly accurate.

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**Embryology, Anatomy and Surgery of Prostate Gland.**—From his observation of 373 cases, Lowsley concludes that the most important item in the care of a patient suffering from prostate disease is suitable drainage until the patient reaches his maximum of renal efficiency. The best kind of preliminary drainage is by means of suprapubic double tube suction, because such a procedure diminishes the edema of the prostate and thus is a factor in reducing bleeding. Sacral or parasacral anesthesia is the most suitable type for prostatectomy. Perineal prostatectomy is preferred because there does not seem to be as much shock as was noted in the suprapubic operation. The post-operative drainage is accomplished by means of a urethral catheter which allows both the perineal and the suprapubic wounds to close.

## ORIGINAL ARTICLES

CLINICAL AND SURGICAL ASPECTS  
OF ACUTE INTESTINAL  
OBSTRUCTION\*

JHO. H. BLACKBURN, M. D.

Bowling Green.

Since the very earliest clinical recognition of intestinal obstruction something of its nature has been understood, and always the condition commonly called "locked bowels" has carried with it a very serious prognosis even to the laity, for a failure to recognize its presence early and to institute immediate operative measures has almost without exception meant the death of the patient. In our own experience extending over thirty years this was one of the first abdominal emergencies encountered, and cases were so uniformly found on the seventh to ninth day and the outcome so uniformly fatal that we were once lead to remark that the mortality in our first six cases of intestinal obstruction was six hundred per cent.

Unquestionably there has been a marked improvement in our diagnostic means and procedures, and the surgical technic in these cases has in every way favored the patient's recovery, but the death rate throughout the country is still alarmingly high. This state of affairs still stresses the fact that these cases must be seen early if we are to reduce the high mortality to any marked degree.

Definition: Intestinal obstruction, or ileus, is the term used to indicate a stoppage of the fecal current, this condition being secondary to some pathology within or without the bowel, which is the primary condition. If the primary condition be a mechanical one we then have a mechanical obstruction; if it be due to some nervous or toxic influence which paralyzes the bowel, it is a paralytic or adynamic ileus; if it be due to a spasm or contraction of the intestinal wall it is called dynamic ileus. The obstruction may be gradual or sudden in onset, and partial or complete in degree, and it may involve only a limited segment or several feet of the intestine.

In addition to the obstruction there is usually present a strangulation of the bowel which means an interference with the venous or arterial circulation in the intestinal wall. Strangulation may occur from the primary mechanical obstruction or it may be present in the paralytic ileus as a result of the distention of the bowel with an interference with the capillary circulation. When this stage is reached a damage to the intestinal wall de-

velops, with the resulting necrosis of the tissues. This pathological sequence may also develop as the result of an occlusion of the mesenteric vessels, vein or artery. All of these conditions lead to an obstruction with the succeeding strangulation, if not relieved early by surgical means.

Causes: Practically the sequence of events in any and every case of intestinal obstruction is the same, viz: stoppage of the fecal stream, distention of the bowel by gas and fluids, disturbance of the circulation in the intestinal wall (necrosis and gangrene if not relieved), and a succeeding grave toxic state due to the absorption of some substance from the bowel contents. When it is recognized that the local and general changes and the ultimate results are practically the same in all cases only a mere recital of the many different causes is necessary.

The mechanical causes are spoken of as external and internal. The external causes are herniæ (external and internal), volvulus, peritoneal bands, acute peritonitis, tumor (by external pressure), and ulcerations (tuberculous or syphilitic by constriction). The internal causes are intussusception, foreign bodies (gallstones, enteroliths, etc.) neoplasms (filling the lumen).

In addition to the mechanical causes, there are those which produce obstruction by interference with peristalsis, these cases being divided into paralytic or adynamic ileus and dynamic ileus. The adynamic cases may be (1) of nervous origin, as in cord lesions or trauma to the abdomen; (2) of infectious and toxic origin, as in peritonitis or pneumonia; and (3) of circulatory origin, as in thrombosis or embolism. The dynamic cases occur characteristically in lead poisoning.

A study of the statistics of acute abdominal disease requiring operation shows that acute perforations and acute inflammation of the appendix with the complicating peritonitis exceed all other forms of abdominal emergencies. However, the cases of obstruction in any particular series occupy a rather large part if we include therein herniæ and their complications. In England and Wales in 1918, according to the Registrar-General's Report, there were 1,990 deaths from perforated peptic ulcer, and 2,416 from acute appendicitis, or a total of 4,406 deaths due to these two causes. During the same year there were 2,848 deaths attributed to intestinal obstruction and 2,200 as the result of hernia. Unquestionably the deaths from hernia were due directly to intestinal obstruction with strangulation, so that we may properly attribute the 5,048 deaths in the last two classes, obstruction and hernia, to practically the same cause.

In the Bulletin of the Kentucky State

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.



Board of Health for June, 1931, State Registrar Blackerby reports the causes of death in the State of Kentucky for 1930, the total deaths from all causes being 29,636. Of this number there were 404 cases of peptic ulcer (presumably perforations), 326 cases from appendicitis and typhlitis, 40 from hernia, and 10 from intestinal obstruction. There were also listed 36 deaths from peritonitis "without specified cause," a number of which might reasonably be attributed to obstruction of some type.

Apparently there were few deaths in the State of Kentucky in 1930 from intestinal obstruction, and yet when those from hernia are added to this there were at least 50 deaths in the State of Kentucky last year which with early recognition and prompt treatment might well have been prevented. Further, the proportion of deaths in this series from obstruction, perforations and inflammatory lesions is practically the same as that listed in other statistics available.

#### CLINICAL CONSIDERATIONS

In view of the fact that the clinical picture of intestinal obstruction consists of such few symptoms and that the evidence of its presence is at least suggestive if not unmistakable within such a short time, it is rather remarkable that so many physicians are still content to wait for hours until the symptoms are absolutely positive before advising operation.

The cardinal symptoms are: pain, nausea, vomiting and constipation, with abdominal distention and a rapidly developing state of toxæmia. There is a difference in the sequence of these symptoms and a variation in their degree of intensity dependent upon (1) the site of the obstruction, (2) upon the suddenness of the closure of the lumen of the intestine, and (3) upon the degree of interference with the circulation in the intestinal wall.

It has usually been stated that the higher the site of the obstruction, the more sudden the onset of symptoms and the less the amount of distention; the sequence of the predominant symptoms usually being pain, nausea and vomiting, constipation. In fact in the cases high up in the intestinal canal the obstruction is usually due to bands or some cause external to the lumen, and the closure is immediately complete with early strangulation and the symptoms resulting from changes in the bowel wall. In the cases in the large intestine, the cause is usually to be found within the lumen, with a gradual closure from a malignant growth, and the gradually increasing constipation occurs first, with intermittent pain and attacks of nausea and vomiting later. In these cases the distention is gradual but usually becomes ex-

treme, and the toxæmia resulting from strangulation and the changes in the intestinal wall is a late symptom.

**Pain:** Pain occurs early in cases with strangulation, by bands, in internal hernia, or in intussusception. The more complete the strangulation the more severe and persistent the pain, and the earlier the appearance of the shock which sooner or later attends every case of unrelieved obstruction. While the pain may be distinctly paroxysmal at first, due to the contractions in the proximal loop of bowel, it will tend to become less severe and more continuous if the intestine becomes gangrenous and peritonitis develops. Hence a relief from severe pain is frequently an unfavorable change. The pain of obstruction is frequently localized at first, later becoming generalized, which will help to differentiate it from that of appendicitis in which the diffused abdominal or epigastric pain localizes later in the right iliac fossa.

**Nausea and Vomiting:** Nausea practically always initiates an obstruction but this may later disappear entirely.

Vomiting occurs early in all acute obstructions and is usually of the projectile or regurgitant type. At first the stomach contents are expelled, then the fluids from the duodenum, and later from the ileum, finally the vomitus becoming feculent. Several explanations have been offered for vomiting of such large quantities of fluid, the primary reason no doubt being the interference with the circulation in the intestinal wall and the disturbance in the functions of the liver and pancreas. Certainly the loss of body fluids attending the excessive vomiting is a prominent factor in the production of the toxæmia which soon develops.

**Constipation:** In every case of acute obstruction the constipation is absolute, no passage of gas or feces, if the case be permitted to continue. An early enema may cause passage of feces from sigmoid, but in very acute cases there may be a paralysis of the lower segment of intestines which will prevent the expulsion of either gas or feces. Barnard's suggestion of a turpentine enema repeated in a few hours is a good one, but that of Cope is better when he says that "if the other symptoms of intestinal obstruction are present, it is unwise to wait twelve or twenty-four hours to demonstrate constipation."

**Abdominal Distention:** It is generally recognized that distention is less marked in cases of obstruction high in the intestinal canal, the most extreme cases occurring in obstructions in the colon. The presence of marked or general distention indicates that the obstruction has existed for some time, the distention frequently arising as a result of the development of a paralysis of the bowel. The distention is usually localized at first, becom-

ing general later, and in this way may help to suggest the site of obstruction. The presence of "patterns" with visible peristalsis, indicates unquestionably the presence of obstruction, although this is seen as a rule only in chronic obstructions, with gradual closure of the lumen.

**Constitutional Signs:** In addition to the symptoms discussed above, the average case of obstruction soon begins to present a characteristic clinical picture, the state of toxæmia found sooner or later in every case if it is not relieved. There is an anxious pinched expression of the face, sunken eyes, and frequently a cold clammy sweat. The pulse is usually slow at first, but later becomes rapid and feeble. The shallow respiration becoming more rapid later is the result of the increasing abdominal distention.

Usually the temperature is subnormal during the earlier stages with the collapse that is ordinarily found, and later a rising temperature is suggestive of a developing peritonitis. The dry furred tongue and offensive breath, with marked thirst are characteristic. If the obstruction is not relieved, all these constitutional symptoms gradually increase in intensity until the patient dies in a few days in coma.

**Site of Obstruction:** While the individual symptoms vary somewhat in onset and intensity as suggested in the discussion above, the clinical picture presented by obstructions in the different parts of the intestine are fairly distinctive, the variations being dependent upon the site of obstruction and the completeness of the strangulation.

In obstruction high in the small intestine the symptoms are very acute, pain is early and extreme, the vomiting frequent and violent, the collapse comes early and distention is usually slight and comes later if the patient survives. Gall-stone obstruction of the duodenum is the most frequent cause of this type of obstruction.

In obstruction low down in the small intestine the symptoms are less sudden and severe than in the high obstructions. The pain is usually marked and collapse comes fairly early. The vomiting comes on somewhat later but is typical as to the character of fluid vomited. Distention comes after a short time and is frequently suggestive in its "spread." In the subacute cases low down in the small gut are most frequently seen the marked patterns, the peristaltic waves often being seen on close inspection.

In obstruction in the large bowel the pain is much less acute and severe, shock or collapse develops later if at all, the vomiting comes later and is less frequent, while the distention comes early in the acute phase of the attack and the pattern may frequently be

seen following the course of the large intestine. Distention is a late symptom in cases of intussusception because as a rule some gas passes all the time.

Complete and sudden obstruction or strangulation is found most frequently in cases of hernia, in acute volvulus, and in internal strangulations. In these cases the onset is sudden, pain usually severe, collapse early and extreme, and vomiting characteristic. Distention comes somewhat later. In gradual obstructions due to adhesions, strictures, subacute volvulus, and chronic intussusception, the onset is less sudden and severe, pain less marked, vomiting less extreme but characteristic later. Distention comes later in these cases, but its location is suggestive.

**Age:** Much has been written regarding age in its relation to intestinal obstruction, but in general it may be stated that intussusception is the most frequent cause in infancy, obstruction by bands in young adult life, and malignant disease in the large intestine after forty years of age. In our personal experience we have seen obstruction from internal hernia in a ten-months-old baby, intussusception in the ileum from a fibroid polyp in a child eighteen months old, and recently a case of obstruction by bands, secondary to tabes mesenterica, in a child twenty-two months old. Which proves that there are many variations to the rule.

**Toxaemia of High Obstruction:** It has frequently been observed that cases of obstruction in the large bowel often survive a long time, but in the small intestine the toxæmia is more marked the nearer the obstruction to the stomach. A vast amount of experimental work has been added in recent years to the large volume of clinical observations already produced, and the literature on the subject is apparently increasing year by year. Many theories have been offered to account for the death that occurs so frequently in these cases, but it is safe to assume that there is no one cause that will account for the toxæmia in every case.

Hartwell and Cooper (Practice of Surgery, Dean Lewis, vol. VII, chapter 7, page 38) present a most complete study of the literature on the experimental phases of the subject as observed in animals and the practical application of all this work to the treatment of obstructions in man. It has been definitely proven that the symptoms are most acute and the toxæmia gravest in those cases in which the obstruction is just below the opening of the pancreatic and common bile ducts into the duodenum. The further away from this point the obstruction, the longer the survival and the less intense the symptoms. In experimental animals the obstruction is fol-



lowed by a uniform clinical picture that follows closely that observed in man, with rather regular changes in the urine and blood.

If a closed loop of small intestine be produced at any point the clinical picture is similar to that produced by a simple obstruction at the same level. If strangulation be produced in an obstruction or in a closed loop, the symptoms are more acute and death more rapid. If the intestinal content above an obstruction or from a closed loop or strangulated loop be properly prepared and injected intravenously into another animal, it will cause the rapid death of that animal with a characteristic clinical picture and typical clinical and pathological changes. The intestinal content of any animal that has died of toxic injection is toxic to other animals and produces the typical clinical and pathological picture. The introduction of the toxic contents into the lumen of a normal small intestine does not cause any toxic symptoms. Death may occur in cases of obstruction and in a closed loop or strangulated loop without any bacterial infection of the peritoneum or blood stream.

While many changes were observed in the experimental animals as a result of the obstruction or the closed loop, with or without strangulation, the uniform changes found were (1) a loss of fluid from the body, (2) a loss of chlorides, (3) a high  $\text{CO}_2$  combining power of the blood, (4) high blood urea with high urea excretion. Much work has been done on the nature of the toxic substance and on its pharmacologic actions, and many theories have been expounded as to its source, but the evidence at hand suggests strongly that the toxic substance is a split protein product and that its elaboration occurs in the pancreas or in changed pancreatic secretion. On the other hand, one group of workers suggest that the toxic substance is elaborated by the intestinal wall and present evidence that is to them satisfactory.

As a result of the enormous work done in the experimental field, it may be positively stated that there are two outstanding facts: first, a profound disturbance in the acid-base mechanism with a resulting alkalosis and dehydration; second, a definite toxæmia. In simple obstruction the alkalosis and dehydration are most marked, with a varying degree of toxæmia. In strangulation and closed loops the toxæmia is the outstanding feature.

**Surgical Aspects:** When an acute intestinal obstruction is once established, its relief by surgical measures is the only means of preventing the fatal outcome. A spontaneous cure in conditions of this kind is almost unheard of, and for this reason every hour of delay only adds to the gravity of the case, and operative in-

tervention should be done as soon as the diagnosis is made. It is much better to operate "on suspicion" in these cases than to while away the hour of grace.

**Principles in treatment:** Since certain changes occur rather uniformly in the bowel and in its contents we may suggest that the principles to be observed are (1) to relieve the obstruction, (2) to evacuate the bowel contents, and (3) to restore the lumen of the intestine. At the same time we must give careful consideration to the state of the patient, for he is usually completely dehydrated as a result of the vomiting and the attendant loss of fluids, and there is ordinarily a marked degree of toxæmia, with a rapid feeble pulse and the evidences of collapse or shock in a varying degree.

Unquestionably a patient in this condition deserves the best in the way of hospital surroundings and an experienced surgeon, and transportation of the patient is frequently less harmful than surgery in the home.

In preparing for the operation a gastric lavage should always be done to relieve the distended stomach, and the retention of the tube as a syphon frequently adds to the comfort of the patient. Remembering the loss of chlorides and the state of dehydration found in these cases, large quantities of normal saline solution should be given before and during the operation by intravenous infusion or by hypodermoclysis.

The choice of an anesthetic rests always with the surgeon and his anesthetist, but many of these cases can be explored by the use of a local anesthetic and an enterostomy or colostomy may be done without resorting to a general anesthetic in a patient who is already profoundly toxic. The use of local anesthesia is indicated particularly in strangulated herniae, and many cases of obstruction by bands may be completed under its use if seen early.

The site of the incision may be placed in some particular part of the abdominal wall if the localized tenderness and spreading distention suggest the location of the lesion in some one quadrant, otherwise an incision near the midline, right or left rectus, with its center at the umbilicus will give the most satisfactory exposure, and it may be extended up or down as conditions may demand. The initial incision should not be made too long until an exploration of the cavity suggests the conditions to be met and the extent of exposure necessary. If the state of the patient warrants a free evisceration and complete relief of the obstruction, the incision may be extended as needed. If the local and general conditions do not justify more than a temporizing measure, this may be done through a small incision.

The extent of exploration and measures employed to relieve the obstruction are in every case to be determined by the surgeon and in border-line cases require the exercise of judgment in determining the measures best suited to the individual case. Frequently the technical skill of the surgeon in carrying out the necessary measures is the determining factor in the recovery of the patient. Too extensive exploration, unnecessary evisceration, and rough handling of the intestines with undue exposure to air and cold often determine the outcome in a toxic, shocked patient.

Since the contents of the proximal loop are so often toxic in nature and influence the circulation in the intestinal wall in a mechanical way, an effort should always be made to empty this loop. While a temporary enterostomy with the use of a Paul's tube or a large rubber tube may relieve the distention in many coils of intestine, it is not a surgically clean procedure and is frequently followed by a peritonitis as a result of the fecal soiling. In the extreme distention so frequently found, especially in the markedly toxic cases, the drainage of a permanent enterostomy should be done, and this may be accomplished with the least difficulty by the technic suggested by Dr. G. A. Hendon, of Louisville. In some cases of mechanical ileus this measure may not only relieve the extreme distention but may result in a permanent relief of the obstruction by releasing a kink or volvulus, or permitting the escape of a loop of intestine from under a band. In cases of paralytic ileus attending a mechanical obstruction or in a spreading peritonitis, the enterostomy finds its greatest field of usefulness.

In any case of ileus the method of handling the pathology found as a cause of the obstruction must be along recognized lines, as in a strangulated hernia, resection for tumor or stricture, in intussusception, etc.

**Postoperative Treatment:** Recognizing that practically all of these cases are in shock from the toxemia existing and from the operative measures necessary, that there has been a marked loss of fluids and of chlorides, with the attending disturbance in kidney function, we may best relieve these abnormal states by the free and frequent use of normal saline solution, giving it under the skin or in the vein. External heat should be applied. Gastric lavage should be used as needed, and in extreme states the use of duodenal drainage is finding many advocates recently. Irrigations of the colon frequently relieve the distention somewhat and add to the comfort of the patient. Since the digestive functions are so much disturbed in these cases, food should be withheld until the intestinal tract is restored to a condition

approaching the normal. If a condition of acidosis should develop this should be met by the use of glucose in conjunction with alkaline solutions.

In conclusion we may state that acute intestinal obstruction is always a serious condition, its symptoms practically always being such that the condition should not be mistaken, for the ultimate outcome is directly in relation to the early recognition of the condition.

Since the serious aspects of ileus depend upon the conditions developing from strangulation and upon changes in the intestinal wall and in its contents, the sooner operative interference is resorted to, the less the hazard of operation. The mere number of hours an obstruction has existed is no index as to the damage done.

The less trauma done in any particular case the more favorable the outcome, hence, the less surgery necessary the more certain the recovery. For these reasons the diagnosis must be made early and immediate operation done, if we are to reduce the mortality in Kentucky below the average.

#### DISCUSSION

**S. C. Smith, Ashland:** One of the important features in the handling of these cases probably would have been brought out by Dr. Blackburn had he had time. He mentioned the fact that sometimes vomiting was delayed, but usually was early. That is true, and distention is sometimes delayed; that it, distention of such extent that you cannot recognize it as being of serious portent. One of the things that I think should be emphasized most strongly in the handling of these cases is the fact that the administration of opiates, particularly morphine, before a definite diagnosis has been made, will sometimes so mask the symptoms that the case will be delayed until it is too late to do anything before the diagnosis is made. In fact, it is my opinion that in all acute abdominal conditions, opiates should not be administered under any circumstances until a definite diagnosis has been made. It has occurred in appendicitis where opiates have been given that the symptoms were so masked and the diagnosis so delayed that the appendix ruptured before the diagnosis was definitely made.

In the diagnosis of these cases in recent years an x-ray of the patient, without the administration of any bismuth or anything else, enables one in practically all instances to make a very definite diagnosis. I have seen that demonstrated, and the location of the obstruction can be made with a fair degree of accuracy. You will find the collapsed bowel below the obstruction, and marked gaseous distention above. Wherever possible, when the diagnosis is in doubt the x-ray should be made in order that the diagnosis will be facilitated.

I saw one particular case where the diagnosis



was made and the obstruction located with such degree of accuracy that the incision was made almost directly over the obstruction.

**G. A. Hendon, Louisville:** The mortality rate of intestinal obstruction is the most serious indictment that there is standing against American surgery today. The mortality has not been reduced materially over a period of fifty years. The mortality stands today at between forty and fifty per cent, which is absolutely reprehensible, for which there is no just or logical reason.

It has fallen to my lot for the last four or five years to lecture on this subject to the students in the University of Louisville, which has stimulated some intensive investigation on my part concerning causes of this condition.

The reasons that I have found (and they are conclusive to me, at least) are that whenever this subject is presented to a state medical meeting, whoever presents it plows in the same old furrow that has been plowed in from time immemorial. It seems that there is an ambition on every man's part to read a paper that will be sound, conservative and rational, and as a result of that sort of impulse we are standing today on intestinal obstruction just where our predecessors fifty years ago stood.

There are only three symptoms of intestinal obstruction, and those three symptoms are: abdominal pain, nausea, and an absence of diarrhea. The symptoms of rapid pulse and distention of the abdomen are not symptoms of intestinal obstruction, but they are signs that your patient is going to die. We have found that the mortality increases at the rate of one per cent for every hour that intervenes between the inception of the obstruction and the beginning of the operation.

One reason for the prevailing mortality is the administration of purgatives. It is almost criminal to administer a purgative to anybody under any circumstances who has pain in the abdominal cavity. There never was a mistier myth in any civilization than that pain in the abdominal cavity was the result of some foreign irritation that could be swept away with a purgative. When we get away from that false notion we are going to reduce our mortality rate in intestinal obstruction and not until then. The purgative does the most harm, not by its action in increasing peristalsis, but because when you give a purgative you sit by and wait to see whether it is going to act, thus "sin away your day of grace."

Another reason is the fact that everybody wants to get a complete picture before committing themselves to a diagnosis, and at the risk of appearing to be tedious I am going to repeat what I have said on former occasions, that the only hand that ever paints a perfect picture of pathology is the hand of death.

I am going to take decided issue with Dr.

Smith regarding the administration of morphine. If a quarter of a grain or a half grain of morphine in somebody else's body can fool you, you had better go back and study medicine. It is the part of humanity to give these people morphine, and when I get to the point where a quarter of a grain in somebody else is going to fool me, then I am going to take down my sign. You might put it in my veins and fool me, but you can't put it in somebody else's and fool me.

If I have any time left, I should like to address a few remarks to another method of reducing this terrific mortality. But I want to say one thing in regard to acute and chronic obstruction. There is just as much difference between their etiology and their manner of treatment as there is between McGuffey's reader and McCormack's reaper. There are two other measures that are going to reduce our frightful mortality in acute intestinal obstruction.

One is the inveterate use of enterostomy, but there is a way to do it, and if I could have the time for a minute I would just like to show you how.

Take a Pezzar catheter such as the urologists use, thread that catheter onto a stilette, and with a very small hole in the bowel insert the expanding end, draw the shank through a hole in the omentum and out at the lower angle of the incision. You don't need to do any sewing, it will stay there. If the bowel is in particularly good condition you can put a pursestring suture around it if you want to, but it is not necessary.

I have often been asked the question: How do you get the catheter out after convalescence is established? You don't get it out. You just cut it off right there and let it drop into the lumen of the bowel. How often have I tried to do the Witzel operation and torn a hole through the intestine, just when a needle went through.

There are three ways to reduce our mortality. Early diagnosis, my method of enterostomy and venoclysis.

**Thomas J. Ray, Lexington:** I live in the country and I frequently make a diagnosis of appendicitis, and in order to get my patient to the hospital I give a dose of morphine. I tell the surgeon what the diagnosis is. Must I wait until the surgeon makes his diagnosis before relieving the pain? Cannot the surgeon make a diagnosis from the history, blood count and urinalysis? Does the surgeon have a monopoly of diagnosis?

**S. C. Smith, Ashland:** Mr. President, I feel I must rise in defense of my stand. I have this to say: If I have an acute pain in my abdomen and Dr. Hendon is called and gives me a dose of morphine before he makes a diagnosis, I don't want him for my surgeon. I had a patient referred to me about three years ago who had very little pain. The patient had previously had

a very large fibroid removed. A little morphine was administered every day by the attending physician. The patient never did have very much pain, developed distention on the fifth day, was brought in, opened up, and died on the table. About two-thirds of the small intestine was gangrenous from obstruction.

I know, gentlemen, that it is dangerous. I am too small a potato to take issue with Dr. Hendon on most things. I admire him very much and think a great deal of him, but I do think that any man who gives morphine in acute abdominal pain, (of course, there are certain conditions that morphine will not relieve, but I know that it will relieve the pain from obstruction in certain instances) may have a dead patient and need an undertaker before he finds out what is the matter.

**G. G. Altman, Louisville:** What has been said is sound and it would be well for us to accept it and put it to use.

However, in spite of talk and all else, late obstruction is and will be seen. In the main, this obstruction accompanies peritonitis and is consequent on infection.

In the handling of it, the idea should be the conserving of life through an emergency.

In our delta country, in flood times, our merchants and householders move to the upper floors and there live, even though uncomfortably, until the flood subsides.

Just such emergency measures must be done in the face of our peritoneal flood with obstruction. The idea is for a complete emergency alimentary canal providing a considerable degree of absorptive surface.

The pioneer work in this was first published by Victor Bonney in 1910 and pertained to the treatment of paralytic ileus by jejunostomy, it was eminently successful in Bonney's hands, though objectionable because of secondary surgery and giving to the patient meanwhile a greatly reduced surface for absorption and inability to take fluid and nourishment enough during a time when he required all that was possible to get the body to take up.

Venoclysis, the maintenance of the body chlorides, calcium, etc., has obviated many of these measures of the past, but the need of doing something in these late cases is still with us and will continue to be, for patients will continue to be late in seeking proper help, doctors will be late in making diagnosis and calling consultants.

Handly has directed our attention in these late cases to his "hypogastric football." At this time the pulse tends to rise and the temperature to fall, the patient miserable, nauseated and vomiting, but the vomiting changed; from an ounce or two heretofore it now becomes as much as two pints at frequent intervals, the abdomen shows a characteristic rigidity, tenderness in the lower half, while above the umbilicus

it is flat or only slightly distended, reasonably soft and only moderately tender. On palpation at this time a rounded, resonant swelling is found almost as definite in its outline as a bladder and called by Handly a "hypogastric football." The upper abdomen at this time is variable, it is not rigid and still moves on respiration, flat or only moderately distended, but this distension rapidly increases as the terminal stage approaches, and the end.

This hypogastric stage, lasting not more than twenty-four hours, is important to recognize, for in it there is still open the opportunity for surgical effort and relief, which is denied us by any other means.

**W. O. Bullock, Lexington:** I just want to say a few words with regard to Dr. Hendon's position on morphine. Dr. Hendon has said there are only three signs, the first of these being pain. Morphine, of course, relieves pain. To my mind and in my experience, pain is the most important of all the signs, and it is the character of the pain that gives us our clue as to what we are dealing with. It is the sharp recurring pain of spasm of the intestine trying to empty itself that gives us our first idea as to what we are dealing with. If you are going to do any good you have got to do it pretty soon after those first pains start. If you give morphine you obliterate those signs.

**G. A. Hendon:** How long does the pain have to keep up before you know it is there?

**W. O. Bullock:** Longer than it should.

**John H. Blackburn (in closing):** Gentlemen, I remarked in my paper that with the few symptoms we have in intestinal obstruction it was rather strange that we still have the high mortality rate in these conditions that we do have. If we have only three to work on: pain, vomiting, constipation, certainly we ought to arrive at our conclusion earlier. That was the one particular point I desired to stress.

We all know Dr. Hendon, and we all know that he is a dissenter, in a way, and yet in spite of all his talk, Dr. Hendon, I think, is rather orthodox, and I believe if he will read my paper when it comes out he will find that in the surgical treatment I have been fairly orthodox in my practice.

The use of morphine is one thing with which it occurs to me I must agree with our dissenter Smith and not with our orthodox Hendon, because I do feel if we are going to do anything with those cases, so long as a man is in pain we have some hope of getting him into the hospital and working on him. If you give him the hypodermic, frequently you are going to have to do all of your work over, and then later on when that pain recurs persuade him to come in and have the work done. Unless it is done early, and before the development of the changes in the intestinal wall, the mortality rate is going to persist.



Another thing in which I cannot agree with Dr. Hendon and in which I believe I am more orthodox is that I spoke about whiling away the hour of grace and Dr. Hendon went so far as to speak about sinning away the day of grace. I am willing to leave it to the crowd as to which of us is more orthodox in that, in intestinal obstruction.

### REASONS WHY THYROIDECTOMY SHOULD NOT BE POSTPONED\*

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Lexington.

It is not my purpose to debate the question of thyroidectomy as an intelligent procedure. That there are some members of the profession who are strenuously opposed to it, is a well known fact. Indeed, it is not unusual for one to pick up a prominent medical journal these days and read consecutive articles, one summarizing the successful treatment by operation of 100 cases of toxic goitre, while the following article may describe numerous cases of unsuccessful surgical intervention as compared with the more conservative and what appears to that essayist as the more rational medical treatment of this rather common malady. For the most part, however, one is correct in saying that those of widest experience with this condition find that the operation known today as the subtotal resection of the thyroid offers the best prognosis.

My remarks, therefore, are directed to those who are not opposed to this procedure under every consideration, but who feel that the operation can be postponed until its indication is to them more apparent. And in this connection I shall mention four reasons why delay may prove hazardous or unwarranted.

The first of these and doubtless the one involving the most controversy is that medical treatment alone seldom cures these patients. We all know that some cases are permanently benefited by the medical routine which is employed and yet it is quite exceptional to see a patient suffering from a very toxic thyroid, whether it be adenomatous or exophthalmic, who is permanently benefited by medical treatment. This brings us to the point that has so often been stressed and which always bears repetition, that iodine is not a cure for toxic goitre. Its influence upon these patients is often most spectacular and yet the fact should constantly be borne in mind that the maximum benefit to be derived is usually seen at the end of two weeks' administration and that its continued use almost invariably results in a return of the

toxic symptoms and disappearance of the beneficial results. Such a case came under my observation a few weeks ago. The patient was 65 years of age and stated she had a goitre for 20 years. Only during the past two years had it been toxic. She had been placed on iodine and had been delighted with the marked improvement which she noted. Much to her surprise and disappointment, however, the influence of this medication has completely worn off and she was growing steadily worse. Such a case as this presents an added problem to the surgeon for he must get this patient into a condition where surgery is reasonably safe and he has not the aid of iodine to depend upon. That has been all used up and therefore he must rely upon rest in bed together with appropriate sedatives to quiet her down. In the case just referred to this was done and while she was given iodine, I attribute her preoperative improvement almost entirely to bed rest and sedatives and very little to the iodine. Not infrequently patients are advised that they are too old to undergo thyroid operation. Here, again, we are indebted to Plummer and his associates, who demonstrated the value and potency of iodine in preparing patients for operation, this being the main indication in the use of iodine in treating toxic goitre. Many advise its use for 2 to 4 weeks following operation. Its value there, however, is not so pronounced as when first administered before the gland is resected. The age of the patient, however, should not, in itself be a strong contraindication to operation. True it is that a patient 65, 70 or 75 years of age requires much more care and deliberation and longer preoperative treatment than do younger patients. Yet the large majority of such cases can be brought through safely and the remaining years of their lives made vastly more happy and enjoyable than had they been allowed to nurse these ailments and finally succumb to their effects.

In the last analysis, therefore, the usual medical treatment consists in the administration of iodine and sedatives, together with adequate rest in bed and avoidance of nervous strain and fatigue. These measures, however, have been proved quite inadequate and all too temporary in their effect and hence one feels justified in discouraging its use in practically all cases.

Now the second reason which I wish to emphasize why thyroidectomy should not be postponed is the ever present possibility of malignant degeneration taking place. This applies largely to those patients 35 years of age and older, and who, in the majority of cases have had a non-toxic adenoma for many years. The actual incidence of carcinoma of the thyroid is difficult to determine. Allan

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

Graham of Cleveland believes it constitutes 2 to 3% of all cases coming to surgery. Crile has observed that in a large group of cases 12% of unilateral adenomas become malignant after the age of 40 if allowed to go without being operated upon. Neoplasms of this gland therefore are not of great rarity, and the most significant etiologic factor is the tendency of malignancy to develop in pre-existing goitres.

Complicating this is the fact that an astonishingly large percentage of these cases are never diagnosed before operation. A very firm, nodular goitre in a patient past 35 years of age should always be considered as a possibly malignant process. Balfour found that in only 18% of a series of 103 cases of carcinoma of the thyroid could positive diagnosis be made, while in 46% the condition was not even suspected. Graham and Dinsmore of the Cleveland Clinic report similar ratios. One should bear in mind also that even though the enlargement is only a very small nodular affair, its presence in an individual 35 years of age or older is sufficient cause for its removal. It is well to remember also that the prognosis in cases of malignant thyroid varied greatly as regards (1) type of tumor, (2) stage at which diagnosis is made.

Numerous classifications of malignant goitre have been offered. Probably the one more generally accepted is that arranged by Graham, who has had a very wide experience with this problem. He makes three general divisions, (1) Sarcoma, (2) Mixed, (3) Carcinoma. Sarcoma are subdivided into Lymphosarcoma and Spindle-cell tumors. The lymphosarcoma is a rapidly growing tumor terminating fatally in a short time and apparently resistant to every type of therapy, while the spindle-cell process is of infrequent occurrence, but likewise universally fatal. It is astonishing to note the rapidity with which sarcomata of the thyroid disappear under x-ray therapy, only to reappear after a few months with the same statling rapidity, when they are unaffected by x-ray.

Under the mixed group he placed carcinoma-sarcoma. This type of tumor usually excites considerable discussion among pathologists and as Dinsmore says in his recent paper on this subject, the patient usually dies before the discussion is ended. These cases in his experience have proved 100% fatal.

More hopeful prognosis is offered in the carcinoma group. Adenocarcinoma not originating in an adenoma was first described by Graham in 1927. The prognosis here is more favorable than in any other type of malignant thyroid. In a series of 16 cases Dinsmore reports all living. The papillary tumor originates in an adenoma, and does not

metastasize so long as it remains within its own capsule.

The most commonly encountered type of malignant tumor originating in the thyroid gland is the malignant adenoma which invades blood vessels and metastasizes through the blood stream. Here early diagnosis and complete removal, followed by x-ray therapy are the chief indications. From this brief consideration, therefore, one may readily conclude that the possibility of malignant degeneration of thyroid tumors is an ever present hazard in individuals of cancer age and should therefore be seriously considered as a definite indication for removal of what often appears to be quite an innocent and harmless growth.

The next point which I wish to emphasize as being another sound reason why thyroidectomy should not be postponed is the frequent development of serious cardiac complications. This, of course, applies to the toxic cases, since non-toxic tumors apparently have little or no influence upon the behavior of the heart. But the individual who shows a definite degree of toxicity and whose heart action is much more rapid than normal, especially one who is past middle age of life, that individual stands an excellent chance of developing serious cardiac complications such as auricular fibrillation, definite cardiac enlargement with myocardial degeneration and ultimate cardiac failure. It is a well known fact that the condition of the heart is a very reliable barometer as to the general condition of the patient. The time for operation usually depends upon pulse rate and general cardiac condition; the question as to whether or not the complete operation may be done at one time is usually dependent upon pulse rate, and the seriousness of the postoperative reaction is practically always synonymous with the general condition of the heart. One, therefore, readily concludes that to avoid cardiac complications is to minimize the mortality associated with the toxic thyroid.

The proper use of drugs in restoring normal function of the heart is of great importance. The value of digitalis in this connection has long been debated. Not a few writers contend that in many cases this drug is not only of very limited value, but is even injurious. Disagreement arises even with regard to the influence, good or bad, upon the fibrillating heart. The majority of men, however, who are qualified to offer opinion in this regard agree that, in the simple tachycardia of hyperthyroidism digitalis has no part, but the fibrillating heart, either paroxysmal or permanent, it may be administered with considerable benefit. When a heart is laboring unduly, in a case of thyrotoxicosis, lightening its load will do more than anything else to



improve its function and this can be done most successfully by the administration of iodine.

Now the last point which I wish to emphasize in this rather rambling discussion is that the operation can be made reasonably safe. If the truth were known, I think we would find more procrastination due to fear of the operation than to any other thing. Many patients look upon this procedure as being quite comparable in its seriousness to the removal of a brain tumor. During the past two decades there has been a rather spectacular improvement in the general care and treatment of goitre patients. Probably the most important contribution to this improvement was the work of Plummer and Boothby in establishing the value of iodine in these cases. It is generally agreed that the rather high mortality associated with this operation years ago was largely due to the fact that the preoperative treatment did not adequately prepare the patient for the ordeal ahead, and probably no patient is less able to withstand any great degree of surgical shock than is one suffering from severe thyrotoxicosis. Fluids in large quantities administered by every route possible; glucose intravenously as necessary; iodine in the form of Lugols solution and given per rectum if not tolerated orally; morphine for quiet if less potent drugs are not effective; these measures, combined with adequate bed rest from one to three or four weeks as necessary will in the very large majority of cases bring about a rather spectacular improvement in even the most severe cases and make, what would otherwise be a most hazardous undertaking, a reasonably safe procedure. I might add that quite frequently marked hypertension is present to add to the difficulties and that in such instances it is often most gratifying to note the marked reduction in pressure along with other improvements. Of tremendous importance also was the work of Crile and his associates on surgical anesthesia. More recently we have found the combined use of sedatives such as Barbiturates, together with morphine, of great assistance in maintaining a desirable state of quietude at the time of operation. These various methods have been definitely demonstrated to be much safer and more desirable than general anesthesia with ether. The combined use of nitrous oxide and oxygen together with local infiltration of the parts, or cervical block has proven quite satisfactory in the hands of competent men. For my part I have found that the administration of 10 grains of Barbitol the night before operation, and 10 grains again two hours before operation and 1/4 grain of morphine hypodermically one half hour before opera-

tion work beautifully as a sedative. As a rule I use no inhalation anesthesia, and infiltrate the parts locally with three-fourths per cent novocaine. These patients experience no discomfort whatever and usually doze off to sleep before the operation is well underway.

It is hardly within the scope of this paper to discuss the operative procedure itself. Suffice it to say that the many hazards formerly encountered are better understood today than ever before and consequently the surgeon capable of dealing with this problem is usually able to avoid such complications as injury to the recurrent laryngeal nerves, postoperative tetany and severe hemorrhage.

My conclusions are, in brief, therefore, that thyroidectomy should not be postponed. Because:

- (1). We feel that the end results of medical treatment alone are quite unsatisfactory.
- (2). Because of the ever present possibility of malignant changes in individuals past 35 years of age.
- (3). Because of the likelihood of severe cardiac complications developing as time goes on.
- (4). Because the operation can be made a reasonably safe procedure.

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#### DISCUSSION

**W. O. Johnson**, Louisville: Doctor Van Meter has so ably presented four excellent reasons why thyroidectomy should not be delayed. Any one of these reasons is sufficient in itself to warrant thyroidectomy in a patient with thyrotoxicosis.

Differences in interpretation in the results in this disease influence some not to accept thyroidectomy as the method of choice in the treatment of thyrotoxicosis. Some say that the operation does not cure. Let us study the con-

dition necessary to produce cures.

Thyrotoxicosis or hyperthyroidism, to be cured, must be treated under five headings, as follows: (1) Correct diagnosis, (2) Proper pre-operative preparation, (3) Diligent post-operative care, (4) Operation, sub-total, or in stages as indicated by condition of patient (5) As important as any of the others, a careful observation of the patient until strength is regained and endocrine balance re-established.

This outline can only be carried out by co-operation of physician and surgeon, and when so done most satisfactory results are obtained.

As regards diagnosis, over 30% of cases seen by me at present, with so-called "goitre trouble" complaining of nervousness, palpitation of heart, weight loss, weakness are the result of "effort syndromes" and exhaustive neurosis and not thyrotoxic in origin. Differential diagnosis is imperative in such cases. These cases are most perplexing when they have a slight elevation of metabolism and fat pads in anterior portion of neck. In such cases, thyroidectomy gives very unsatisfactory results.

Little can be added to the technique and care of patients while in the hospital but one fact is outstanding, that patients prepared with iodine for a short period of time have less reaction post-operatively and give better results than those who have had long periods of iodine treatment.

There are three points as regards the operation that should be stressed: (1) Removal of sufficient amount of gland to produce cure, (2) Meticulous hemostasis and tissue handling, (3) Avoidance of injury to recurrent laryngeal nerves and parathyroids.

The complications of the operation, if any, usually arise from one of these three sources, and if no complications arise the results are usually excellent. I know of no operation that gives more satisfactory results.

The thyroid patient is different from the other surgical patients, and unless she is carefully followed by the medical man and surgeon until she has regained strength, built up a physical reserve, and re-established an endocrine balance, the results will not be lasting or satisfactory. This requires time, but when properly done is physically, economically and physiologically most satisfactory.

These cases usually have an etiological factor in the production of the disease, and unless this is removed from their environments before the patient returns, it may again be the cause of failure in cure.

In cases of malignancy or toxic adenoma, the problem is somewhat different. Prophylaxis is the keynote to success in these cases. Isolated adenomas are foetal in origin and their progress is toward malignancy. Multiple adenomas eventually produce toxicity.

Patients with single adenomas should have

them, for prophylactic and cosmetic reasons, removed before thirty-five years of age to prevent malignancy and toxicity. Do not allow these patients to wait until they have myocardial degeneration then remove adenomas and expect excellent results, but remove the source of toxin before degeneration begins.

The thyroid operation adjusts the physical and physiological problem, so that by the co-operation of physician and surgeon the patient can have a restoration of energy, an establishment of endocrine balance, and with the removal of etiological factor from their environment, they can be cured, return to their former occupation and remain cured.

**Walter I. Hume, Louisville:** Dr. Van Meter has given us four reasons for not delaying thyroidectomy, every one of which is valid. In many mild cases of hyperthyroidism undoubtedly medical care, proper administration of Lugol's solution, etc., will help to re-establish a metabolic balance more or less permanently. In other words, there is such a thing as medical treatment that perhaps will result in permanent reestablishment of balance.

Once hyperthyroidism is definitely established, undoubtedly removal of a sufficient amount of the gland is the most effective way of breaking what might be called a vicious circle and leading to the re-establishment of a normal metabolic rate for the patient and a restoration to health.

There are several things of importance in Dr. Van Meter's paper that I can only emphasize. First of all, I think that the first reason is perhaps most important, that Lugol's solution, iodine in any form, is not a cure for hyperthyroidism. In exophthalmic goitre, particularly, the results of its administration are dramatic, amazing in some cases at first. I am quite sure that the profession generally, those of more experience particularly, are in accord with the idea that you get the best results with the first administration of iodine. It has been my experience over quite a few years now that with the exophthalmic type of toxic goitre you will almost invariably get a splendid result with Lugol's solution, rest, etc. If this result is misinterpreted by the patient or the physician and a cure is promised, almost surely that is going to lead to recurrence of all the symptoms and to a situation in which you will be unable to get the patient in the same good condition for thyroidectomy as with the first trial treatment of Lugol's solution. I believe that should be emphasized and accepted.

We have had cases that have been so benefited that they have refused operation and have gone for months and had their exacerbations of symptoms, with the recessions that naturally go with the case, and finally have drifted into an operation at a later stage when they don't stand it as well, or if they persist in medical treat-



ment, sedatives, Lugol's rest, etc., they finally get into the stage of "goiter wrecks."

The mortality in cases that are diagnosed early, properly prepared, and who submit to the thyroidectomy, ought to be something like one to two per cent. I am quite sure in some of the larger clinics they can show a mortality of one per cent or under in a great many instances. The mortality in these cases allowed to drift with medical treatment, with their exacerbations of symptoms and their recurrence of heart hurry and nervousness and loss of weight, diarrheas, and so forth, undoubtedly will be a great deal more than that. That is one of the main reasons for urging thyroidectomy when the patient is properly prepared at first. The mortality mainly is in the cases that have deferred operation, have had treatment and more treatment and more treatment.

One point as to rest in bed. Following Straus in Chicago, whose clinic I have visited several times, I have discontinued the absolute rest in bed program for most goitre cases. Undoubtedly persons put to bed for some days to weeks soften up a bit. Put a well person to bed for a while and he is not as able to get about and resist things as before. We like for these patients to be prepared by getting the pulse rate and the metabolism down to within reasonable range without confining them absolutely to bed, and we think it is a more sure test of how they are going to behave at operation and in the post-operative period. Let them up and around a bit and get them down to a fairly normal rate of metabolism, pulse rate, and so forth, and they are better risks than if they are flat in bed.

**J. Farra Van Meter**, (in closing): This is a very interesting subject, and one could talk on and on, but I shall confine myself strictly to the subject assigned to me.

I am glad Dr. Johnson emphasized the need of these patients being taken care of by one who is thoroughly competent to do it, and also intimate relation with the internist. It certainly requires considerable work which is not all done in the operating room, so the story is not all told then.

The more one sees of thyroid disturbances, the more one is impressed by the fact that we do not know the secret of this gland. There is much yet to be learned from it, but for the time being we certainly feel that surgery offers the best prognosis in these cases that are definitely pathological. It is probable that the time will come when research work further in this line will show the true etiology of this disease and probably will allow the patient to avoid surgery.

## CONTRACEPTION: A REVIEW OF INDICATIONS AND TECHNIC\*

SCOTT D. BRECKENRIDGE, M. D.

Lexington.

The question of contraception has become such an intermingling of both medical and sociological argument and discussion and has led to such rancorous exchanges, even to the extent of court proceedings and jail sentences that it seems wise to relegate the sociological aspect to a relatively unimportant place in the present review.

Although various types of contraception have undoubtedly been practiced with more or less measure of success from time immemorial, the modern era of sociological consideration dates from the publication in 1798 of the first edition of Malthus' "Essay on Population." Among the supporters of the Malthusian idea in this country were such men as Thomas Jefferson and James Madison. It was not until the middle of the next century that Dr. George Drysdale's work, "The Elements of Social Science," which presented this subject from the economic, philosophical and medical standpoints was published in London. In the present day movement to treat this subject as a sociological problem, the best known names are probably those of Mrs. Margaret Sanger in this country and of Dr. Marie Stopes in England. The importance of Mrs. Sanger to the present discussion lies in the fact that she has been the moving spirit in the American Birth Control League, which has conducted a research clinic in which extensive and intensive studies have been made as to the relative efficiency of various methods of contraception and which has given to the medical profession at large detailed information as to methods and technic.

In the broadest sense, the medical indications for contraception may be divided into the relative and absolute. The relative indications will be found in those patients who, for one reason or another, have been profoundly and adversely affected by a previous pregnancy and must be given an opportunity for full recovery before assuming again the same burden. Such instances will be found in the severe renal and hepatic toxemias and such adventitious complications as marked secondary anemia. A relative indication might also be found in the desirability of preserving the ideal interval between children, which is probably not less than two years. Among the absolute indications will be found those constitutional diseases and definite organic affections in which the burden of preg-

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

nancy and labor may prove the deciding factor against complete recovery or against the prolongation of life. Among these will be found serious heart and kidney disease, diabetes and active tuberculosis. It is true that any of the four conditions mentioned may fall into the relative rather than the absolute classification, but this decision is definitely one for the internist rather than for the obstetrician.

It is certainly true that, if the medical profession is going to tell its women patients that they must not have babies, it must be prepared to intelligently advise them as to the best method of avoiding this contingency. It would appear from a careful perusal of the statistical studies of the research clinic of the American Birth Control League that certain facts had been fairly well established. It would appear that, in spite of success in individual cases, the "safe period," douches, condoms, suppositories and many of the pastes and special apparatuses on the market cannot be depended upon. Conversely, a properly fitted occlusive pessary, particularly when reinforced by the accompanying use of a suitable spermaticidal jelly, gives a very high degree of protection. In the foregoing assertion, particular emphasis must be placed upon the proper fitting of the occlusive pessary. As these articles are manufactured in eight standard sizes, ranging from fifty to eighty-five millimeters in diameter, it is readily understood how disappointing a rule of thumb prescribing of just any old pessary might prove. The manufacturers make sets of measuring rings, which are identical with the coiled spring borders of the regular pessaries but do not have the occlusive diaphragm of live rubber. It is very simple, with a set to find just which size is suited to an individual. The requirement is that the pessary should fit well up into the cul-de-sac and into each of the lateral fornices, while the lower border fits snugly behind the arch of the symphysis. In this fitting, the cervix should present well within the circumference of the ring. In cases where these criteria are not met, it is probable that full dependence cannot be put in the standard diaphragm and that one of the special forms will have to be employed, or possibly a special design manufactured. If a small amount of the spermaticidal jelly is placed in the dome of the diaphragm and the same material is applied to the borders of the ring in the place of lubricant, a very high degree of protection is afforded. It has appeared that, in intelligent patients, either the occlusive diaphragm or the spermaticidal jelly alone will give something over ninety per cent protection.

In regard to the method of use, the patient

having been instructed in the application of the diaphragm and jelly is advised to put the pessary in place every night, as a routine part of the evening toilet. It may be noted that this procedure meets both practical and esthetic objections to the incidental use of the method. The next morning some simple douche should be taken, one-half before and the second half after the removal of the diaphragm. The diaphragm is then washed in soap and water dried thoroughly and kept away from the light. With this care, a diaphragm should last between six months and a year.

Various formulae have been evolved for the spermaticidal jellies, one of the most satisfactory having been found to consist of one or two per cent lactic acid and one-tenth of one per cent oxyquinoline sulphate in Irish moss. In nulliparae, with an introitus that does not permit the introduction and use of a diaphragm, the jelly alone, placed about the cervix with a long tube applicator fitted to the collapsible tube in which the jelly is dispensed, gives a high degree of protection and is probably the only practical recourse.

Although contraception by sterilization was probably not intended for inclusion in this discussion, it cannot be entirely ignored in any approach to the subject. In any patient falling within the absolute indications who undergoes abdominal section, it is believed that resection and closure of the cornual insertion of the Fallopian tube should be performed. As a gynecologist and obstetrician, whose natural sympathy is with the woman, in those cases of elective procedure where the physician is consulted as to the advisability of operative contraception, vasistricture, vasotomy or vasectomy in the male is recommended rather than abdominal section in the female.

In conclusion, it is desired to emphasize the statement that the physician is not justified in advising contraception in a patient where the indication is absolute and then in leaving her to her own resources in discovering the best method. The American Birth Control League has conducted a research clinic for the purpose of determining the most dependable method and has made its results available to the medical profession, so that the excuse of ignorance no longer pertains.

#### DISCUSSION

**Henry M. Rubel, Louisville:** I did not know that I was to discuss this paper. I just heard the last of Dr. Breckenridge's paper, and was very glad to have heard what I did.

I do not believe anybody who is doing obstetrics or gynecology can sit in the office any day in the week without having some very fluent gentleman come in with some new kind of dia-



phragm. I recently had one come in who was a "Colonel" So-and-So. He had a preparation that is being put out by some Eastern concern, which consists of a glass applicator with a strong rubber bulb attachment. When you force the plunger down it has an inordinate amount of pressure back of it. You are supposed to take up a definite amount of lactic acid jelly, which comes supplied with the outfit, and after it is introduced and pressure applied, a coating of this material is supposed to cover the cervix and the posterior cul-de-sac. It is supposed to diffuse this lactic acid jelly within a certain definite radius.

As soon as the spermatozoa comes in contact with this jelly, they are supposed to be rendered harmless or non-virile. After seeing any number of these contrivances, it seems to me that they are very good measures by which the patient can become definitely pregnant. If you have ever seen and talked to any of these ladies who have tried to insert any one of these diaphragms, you will know how far at sea they are, and I feel sure that if we are to do any good whatsoever, we have got to have either trained nurses or doctors who will undertake this job. A large per cent of them do not know how to introduce the various devices or diaphragms even after constant instruction. If the doctor is willing to take the time, as that is the only way he can instruct the patient properly, he ought to have a nurse in constant attendance with him. The only way to introduce the diaphragm properly is to have the woman in a stooping or squatting position.

There is some talk of establishing various clinics throughout the country. Some of them are in operation in Chicago, New York, Philadelphia, etc. I think that there ought to be such clinics, but they must be conducted upon highly ethical and scientific lines, if we wish to reach the women to whom such procedures are to be a benefit. You just cannot tell a woman how to do it; half the time the diaphragm will be two-thirds off the opening. The ordinary diaphragm that is recommended is a very formidable apparatus and women are not coming in and have any doctor fit them up. They must be educated by a number of fittings before they can be left on their own responsibility. If the woman is properly trained and coached, she may use it with very gratifying results. I think we ought to have a definite number of married trained nurses to whom this type of work could be relegated, under the supervision of the physician and who can win the patient's confidence and actually fit the diaphragm in place, and then have the patient insert the diaphragm under their personal supervision.

I do not see how these diaphragms can stay in place with many of the flattened cervixes that physicians see in the course of their practice. The woman puts it in and thinks she has

it in place, and when you examine it, it is away off center. Personally I think it is a very good obstetrical apparatus. I really think the woman will get pregnant from the way the diaphragms are being fitted right now, however.

As Dr. Breckenridge says, as soon as you advocate an operation to a father, he hesitates. Last year we had at our City Hospital, in Louisville, a woman who gave birth to her eighteenth child, and when I broached the subject to her husband and said, "You ought to have an operation performed," he said, "How will that prevent her from having another child?"

This is an important subject and Dr. Breckenridge is to be congratulated upon his fearlessness in discussing this subject in the presence of such a distinguished gathering. This question is a momentous one and much is to be said pro and con. Of course, physical handicaps such as serious cardiac lesions, tuberculosis, syphilis, epilepsy, etc., would, in itself, interdict pregnancy.

**W. O. Johnson**, Louisville: I certainly have enjoyed Doctor Breckenridge's paper.

Last spring while in Philadelphia I spent some time in going over the methods and records of their maternal Health Center. A visit to one of these clinics gives one a different viewpoint and attitude towards this problem.

In the Philadelphia Clinic they are very thorough. The patient has to be referred to the clinic by at least two agencies that have previously studied the problem, and after Social Service, Family Service or other such organizations have established the problem. The patient must then express a willingness to cooperate before the Maternity Health Center is considered.

Then the clinic appointment is made by the Social Worker on the case, and she accompanies the patient to the clinic, and presents the problem as a representative of the organization from which she is sent.

The patient is then thoroughly examined by selected doctors and nurses, who carry out the proper dignity and seriousness of the problem. At this time pelvic measurements are made for the proper fitting of the diaphragm. If physical defects are found they are indicated to the patient and the importance of necessary corrections is stressed and are to be carried out in other clinics. By means of models and drawings the patient is then instructed why and how such a diaphragm is to be used. When the patient fully understands her instructions on models, she is then prepared for a vaginal examination and taught by the doctor, with the aid of the nurse, how to apply the jelly to the diaphragm, and to insert the vaginal diaphragm into herself. This is continued until she is competent to insert the diaphragm properly and to know when it is in correct position.

Patient is then given a diaphragm that fits

her and a tube of paste and instructed to insert the diaphragm each night as a part of her regular toilet, and to remove it each morning after thorough douching, and to take a second douche after the diaphragm is removed. She is to return to the clinic at the end of one and three weeks, so that a complete understanding may be obtained by the patient.

During the time at home, she is still under the supervision of the social worker who came with her to the clinic. In this way the patient is at all times under supervision.

A clinic so conducted, dignifies a problem which can easily be mistreated, and so elevates the plane that the problem can be handled with discretion and dignity, and enable us to give help to those who are really in need of it.

This is a big and difficult problem, and in trying to solve this problem in this manner it presents another to face, that is, in helping a few needy people who might qualify for such help, you may be the means of propagating knowledge which will be taken up by the laity, misused, as is usually the case in such instances, and by so doing produce more harm to the masses than good to the needy few.

By proper supervision and control in a dignified manner, in carefully selected cases, the correct knowledge about contraceptives may be given out with much benefit to those who need it.

**Edward Speidel, Louisville:** It seems to me that in this matter of contraception every doctor has to form his own conclusions. It may be repulsive to some. There is one important point to consider: where religious beliefs interfere, the advice must never be given unless requested by the person of such belief, otherwise the doctor may get into rather serious trouble.

In my mind there are certainly very distinct reasons for the use of contraceptives. If a woman a short while before has undergone an abdominal operation, to subject a scar of such an operation to the enormous distention that occurs in the eighth and ninth months of pregnancy, with the possibility of a ventral hernia, is unwise. The same thing holds good when after a difficult labor a woman has been subjected to extensive cervical and vaginal repair, a repair that will be absolutely nullified if another pregnancy follows in a short time.

The same thing holds good with the toxemias, as Dr. Breckenridge mentioned. If a woman has gone through the excessive distress of an extreme hyperemesis gravidarum and is fortunate enough to have a living baby, in such circumstances you can readily understand that there would be some destruction of liver tissue and a pregnancy following shortly upon such a condition might result in the loss of her life.

In the late toxemias of pregnancy the condition is even more serious, perhaps. Although we try to believe that the kidney of pregnancy

in the condition that occurs in preeclampsia and eclampsia generally resolves itself, it would follow that it leaves the kidney in a weakened condition, and a pregnancy following shortly thereon would certainly result in chronic kidney disease. The condition is even more serious if the eclampsia was attended with partial blindness, because the partial blindness will generally clear up after the first eclampsia, but if a pregnancy follows shortly afterward you may have total blindness, as occurred in a case of mine in which for religious reasons an interference with the pregnancy was not tolerated.

Consequently, in conditions of this kind I think the doctor, unless there are religious objections, should give the patient contraceptive advice. He should not stoop to give these contraceptive measures to young people who simply want to use them in order to gratify their sexual desires without suffering any consequences.

**Harry A. Davidson, Louisville:** I think we must all agree that there are some indications for the use of contraceptives. Of course, as Dr. Speidel indicated, the Roman Catholic Church, as you know, would interdict any such teaching, and the physician must remember that, with his Roman Catholic patients. But there are cases of married women who should not become pregnant, there is no doubt about that. I have seen cases and every obstetrician and gynecologist in this room has seen cases of women who should not become pregnant again soon.

I do not agree with Dr. Rubel that this should be put in the hands of nurses. I believe it should not be taken out of the hands of the medical profession. The physician himself should decide whether a contraceptive should be used, not a nurse. It takes a medical education to decide that question, and the nurse, of course, is not fully qualified to decide it.

On the other hand, I don't agree with him that it is so very difficult to teach the patient to use the contraceptive. These diaphragms that are used now and put upon the market with liquid that goes with them, I won't mention the name of any one, there are several, any intelligent woman can use after she is shown how. It should be introduced in the doctor's office first. It should be measured, the woman should be examined carefully and should be given the proper size diaphragm, and then she should be shown how to use it. The doctor should use it first, then let the patient use it, and after one or two attempts, as a rule, the woman can introduce it at home very easily.

One phase the doctor mentioned after cesarean section. Of course, a woman may have four or five or six babies by Cesarean section. A number of such cases are on record. I delivered a woman of two by Cesarean section myself, and then it was only because she was tuberculous and had a tuberculous hip that I decided to



operate upon her so she couldn't have any more. As every man who has done that kind of operation knows, it is a very difficult thing to do. It is hard to prevent conception even by certain operations during the operation of Cesarean section, and it takes a very complete operation to prevent future conception.

I believe this is a subject that probably would have been discussed before in this session if it had not been that people have an idea that it is criminal to use contraceptives. The laity in this country have an idea that it is illegal even to discuss this question, but I believe they are gradually getting away from that now, and these clinics that are being held in the East, in New York especially, have gradually educated the people, and I understand such clinics are being introduced in large cities in the West. I believe they even want to introduce one in Louisville. Someone was around to see me some time ago, wanting to open such a clinic, but I don't believe it has been done as yet.

I think this subject merits discussion by the obstetricians and the gynecologists, and I don't believe they ought to be afraid to get up and discuss it freely.

**Scott D. Breckinridge**, (in closing): I have nothing to add to the discussion. I enjoyed everybody's answering everybody else and answering me, and I think that in the discussion, everybody was answered.

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**Epidemiologic Notes on Acute Anterior Poliomyelitis, Geno.**—Maghano, after reviewing rapidly the bibliography of infantile paralysis with regard to the pathologic anatomy, etiology, clinical aspects and epidemiology, describes in a general way 134 cases of poliomyelitis diagnosed in the commune of Geno. He then discusses at length the epidemiology and contagiousness of the disease from various points of view, and reaches the following conclusions: Early diagnosis is difficult. It is difficult to determine exactly the period of incubation. He regards the phenomenon of a "convulsive attack" as a prognostic symptom of grave paralysis of fatal outcome. Slight importance is to be attributed to the economic factor and to the state of nutrition of the patients in relation to the morbidity. The author accepts what has been brought out by other authors with regard to the greater incidence of the disease among males, and in persons of a certain age and at certain seasons. He does not assign much importance, as regards transmission of the disease, to animals in general, to blood parasites or to infected objects. Contagion is easy, but the disease is not contracted readily. Great importance is attached to carriers. Absence of multiple contagions in the same family, even in the presence of proved contacts, is emphasized.

## ECLAMPSIA, A PREVENTABLE DISEASE\*

EDWARD SPEIDEL, M. D., F. A. C. S.

Louisville.

There is no more harrowing an experience, than to witness a pregnant woman in eclampsia and when it is realized that fully one-fourth of the maternal mortality in obstetrics is due to this condition, then there certainly should be very incentive to prevent its occurrence if possible.

With careful, early and continuous prenatal care, it now seems possible to either prevent eclampsia from occurring or to recognize the fact that it is impending in the early stage and still to prevent it.

It is unfortunate that we do not know the cause of eclampsia. It is claimed that in late pregnancy, a toxine circulates in the blood, which causes thrombosis in the smaller blood vessels, especially in the liver, the kidneys, and the brain. This with the accompanying edema especially in the brain is said to cause the convulsions.

Of late it has been ascribed to a carbohydrate deficiency due to the large amount of glycogen that the fetus requires for its development. It is well known that the liver is the storehouse of this supply and when there is an excessive drain beyond its resources, then degenerative changes occur culminating in eclampsia.

Again it may be assumed that in ideal circumstances the pregnant woman is able to eliminate her own toxins and those of the fetus through the various excretory channels, but let something go wrong with the intestinal, the renal, respiratory tract or the pores of the skin, then there is an immediate accumulation of toxic products which either gradually or suddenly culminates in eclampsia.

Fortunately we have certain characteristic signs and symptoms that warn us that the patient is in danger of an eclampsia. Accordingly it becomes the duty of physicians conducting obstetrical cases to require their patients to report to them early in pregnancy for a preliminary, complete examination and then to compel them to report at regular, stated intervals until delivery in order that they may be protected from the various complications that may occur. It is only by such dogmatic rulings that the incidence of such a disease as eclampsia can be minimized.

The pregnant woman should be made to realize that a scarlet fever or a diphtheria in her childhood may have initiated a mild

\*Read before the Kentucky State Medical Association at Lexington, September 7-10, 1931.

nephritis that will become severe in pregnancy. She should be told that infected teeth or tonsils and suppurating ears infect the kidneys and in the late months of pregnancy only a slight indiscretion, chilling of the body may suddenly incite acute nephritis and an eclampsia. The pregnant woman must learn to submit to all kinds of dietary restrictions, especially if she is gaining more than the customary twenty pounds, estimated as a normal increase during the period of gestation.

Midnight suppers and afternoon picnics are taboo for danger lurks in the festive hot dog and hot tamale, the lobster and shrimp salad. Far be it from me to claim that such abnormal foods can cause eclampsia but in practically every instance when we can get the history some sort of a dietary indiscretion precedes the onset of the attack. In the colored race cabbage and greens boiled with bacon generally is the fore runner of the attack. The pregnant woman must be warned against the excessive drinking of coffee, tea, and especially coca cola, as they all increase blood pressure.

The blood pressure of the pregnant woman is an ideal danger signal for this toxemia. It is generally low in the normal patient 120 or less. In consequence a rise in blood pressure is practically the first indication of some disturbance and dogmatically we have come to consider an elevation to 135 as evidence of toxemia and 150 as the danger signal preceding an eclamptic attack. Headache, ringing in the ears and disturbances of vision generally go with such an elevation of blood pressure and should not be ignored. In addition then you will soon have puffiness of the lower eyelids and edema of the face and lower extremities. An examination of the urine at such a time should show albumen and casts. It is well in such circumstances to get the 24 hour elimination and to test the urine for pus, for a pyelitis may also be the initial cause for the disturbance.

If we wait for black spots before the eyes and especially partial blindness then our patient has already gone too far, as the finding of an albuminuria retinitis is a positive indication for the interruption of the pregnancy to prevent an eclampsia.

In this connection it should be interesting to learn what can be accomplished by systematic prenatal care in a large clinic. Since the establishment of the Prenatal Clinic of the Louisville City Hospital in January, 1924, until January, 1931, out of a total of 6959 deliveries, 4637 were clinic and 2322 were non-clinic patients. There were 20 cases of eclampsia in the 4637 clinic patients or 43% with no maternal mortality.

whereas in the 2322 non-clinic patients there were 55 cases of eclampsia, 2.36% with a maternal mortality of 12. In other words, there were five times as many cases of eclampsia in the patients that had no prenatal care.

It is self evident then, that in prenatal care we have an opportunity to detect the early signs which point to eclampsia and to correct them as they arise, but a patient in the interval may often inadvertently commit some indiscretion that may at once precipitate an eclampsia. There are so many factors that can easily disturb the ordinary functioning of the excretory organs, that it becomes difficult to safeguard a patient against them.

In my own experience a patient in the last month of pregnancy, following instructions, took a walk on a chilly afternoon in March, then tired and possibly chilled, ate a hearty dinner of pork chops and vegetables. The following day she had a severe headache, and spots before the eyes. Her blood pressure was 178 and a convulsion occurred before she was gotten to the hospital.

It may be supposed that in consequence of being tired and chilled when this patient ate this somewhat indigestible food that fermentation instead of digestion took place in the stomach and the toxic products caused by this perverted process with the toxins of pregnancy circulating in the system were sufficient to precipitate the eclampsia.

In a referred case where some prenatal care had been given by the attending physician, the urine showed 4 plus albumen, a blood pressure of 190 with a twin pregnancy. Fortunately efforts to avert an eclampsia by several large 20% intravenous instillations of glucose were successful, the patient went into labor and gave birth to living twin girls. Here we had a true case of carbohydrate deficiency with a number of factors bringing about a possible eclampsia. It is well known that the fetus requires a great amount of glycogen for its growth and maintenance in the latter months of pregnancy. The placenta is the source of supply for the fetus after the third month and naturally the larger the placenta the greater the glycogen requirements on the maternal liver which of course is the original source of supply of the carbohydrate. In this instance the large placenta of the uniovular twins with perhaps the interference with elimination caused by the pressure over distended uterus was sufficient to precipitate the eclampsia.

In another case the patient was transported to the city in an open automobile for 60 miles on a cold chilly night in February. In consequence of albuminuria and an increase in blood pressure the patient had been on an absolute milk diet for two weeks. She



was extremely edematous and had a number of severe convulsions on the way and after arrival at the hospital. Several apparently trivial points were over looked in the preliminary treatment of this patient. Patients with such symptoms should not only be put upon a milk diet but should be protected from changes of temperature, by confinement to bed. Furthermore, it was found that this patient partook of from six to eight pints of milk from a pure bred Jersey cow. Now it must be remembered that the writers of our text books are generally city professors and when they refer to milk they have in mind the product that is left at our doors every morning. This patient suffered from a fat anyphylaxis which with the exposure to improper temperatures, was sufficient to precipitate the eclampsia.

Finally there are some fulminating cases of eclampsia that occur without a preliminary rise in blood pressure or an albuminuria. It is only fair to state then that through careful attention the occurrence of eclampsia can be largely reduced but that it nevertheless may suddenly occur even in the practice of the most painstaking physician and its occurrence therefore, should not be viewed as possible neglect on the part of such a doctor.

When evidence of pre-eclampsia such as rise in blood pressure, urinary symptoms and edema show in a patient, then measures should be taken at once to correct them. Elimination by the bowel with Magnesium sulphate, the restriction of the food to green vegetables, fruits and milk and plenty of water to stimulate diuresis, daily warm baths to aid elimination by the skin should all be instituted. If the patient does not show rapid improvement from these measures, then the extreme treatment for pre-eclamptic toxemia should be instituted at once.

The patient is confined absolutely to bed until the condition is relieved. We have found the following routine very effective. The patient receives a soap suds enema, then 20 c. c. of 10% mag. sulph. is injected deep into the gluteus maximus muscle once, twice or three times daily as indicated. The patient receives 500 c. c. of 20% glucose solution once or twice a day to promote diuresis and to relieve the carbohydrate deficiency that is supposed to cause this condition. These procedures are repeated daily. In most instances the patient improves, goes into labor naturally and the condition is at an end.

If there is no marked improvement or if the patient improves and with a well advanced pregnancy does not go into labor then after a reasonable time labor is induced by rupturing the membranes and introducing

a large Vorhees bag or by Cesarean section under local anesthesia. We lost a number of babies by trying to carry the patient to full term after the toxemia apparently was under control. We had lost sight of the fact that in these late toxemias, there are destructive changes in the placenta, red and white infarcts. These practically dead areas in the placenta secrete toxines even after the toxemia is corrected and the fetus may succumb from the absorption of these toxines.

When all of our efforts at prevention fail and the patient has convulsions, then the routine treatment for Eclampsia in use in our clinic is at once instituted.

The patient is placed in a quiet room, then  $7\frac{1}{2}$  grains of sodium amytol are injected deeply in the upper inner aspect of the gluteus maximus muscle, followed by 15 c. c. of 25% magnesium sulph. solution.

We then give an intravenous injection of 500 c. c. of 20% glucose slowly and at the proper temperature. By that time the patient is generally under the influence of the sedatives first administered and the following procedures can be instituted without inciting a convulsion.

The blood pressure is taken, the fetal heart auscultated, a catheterized specimen of urine is obtained and a vaginal examination is made to determine how far advanced in labor the patient is.

Then  $\frac{1}{2}$  gallon warm soap suds is slowly introduced into the rectum, followed by gastric lavage with one to two gallons of warm Sod. bicarb. solution. At the end of the lavage 2 to 4 ounces of saturated solution of magnesium sulphate are introduced before the stomach tube is withdrawn.

The gastric lavage is given for a double purpose. Firstly, we generally find some indiscretion in diet to precede our eclampsias and removal of the fermented residue certainly relieves the situation. Secondly, the intestinal peristalsis induced by the lavage, serves to expel the soap suds enema previously introduced into the bowel and to aid elimination in that direction until the magnesium sulphate has time to act.

Any further convulsions are controlled by repeating the intra-muscular injections of magnesium sulphate.

If the patient is in a coma, then we begin with intravenous injections of 100 c. c. of 50% glucose and repeat until the condition clears up. If the blood pressure is over 175 and the patient is in labor, then we rupture the membranes. If the patient is not in labor, then we introduce 500 c. c. of 20% glucose solution repeating as indicated.

If dilatation is complete, then delivery is expedited by forceps or version. We rarely

resort to Caesarian section and then under local anesthesia.

In extreme cases a spinal tap is used, the amount of fluid withdrawn depending upon the pressure of the fluid. In a couple of extreme cases we finally succeeded in controlling the convulsions by introducing the Gwathmey ether oil mixture into the rectum.

Thus with these simple measures, which any up-to-date doctor can perform, we can often prevent eclampsia and if it occurs use the final measures for its control thereby saving many a mother and her baby for posterity.

#### DISCUSSION

**A. J. Whitehouse, Lexington:** I have appreciated the excellence and practicality of Dr. Speidel's paper, and I was especially impressed by his choice of subject, "a preventable disease," in other words a disease that can be prevented, and that by the adequate pre-natal care that we owe every pregnant woman.

Many of the case reports of eclampsia bear that sad notation, "No pre-natal care." Many of them must bear at least the notation, "Inadequate care," because we know with rare exception that the onset of eclampsia is heralded most of the time by at least one of the signs or symptoms that the author has fully covered.

It is fortunate that the profession is coming to an appreciation of the fact that a mere routine urinalysis at certain intervals does not constitute adequate pre-natal care. An albuminuria may be subsequent to an increased blood pressure. The cloister of the new Chicago Lying-In Hospital bears an escutcheon on which will be placed the name of the person who discovers the cause of eclampsia. While that escutcheon is as yet unnamed, there are certain factors which are important to us in prophylaxis. I refer here to the higher incidence of eclampsia in those cases of primiparity and in multiple pregnancy or hydramnios and in the endocrine disturbances women of neurotic tendencies and in cases of previous liver and kidney disease. Hence, it is quite important for us to watch for these early signs and symptoms in these patients especially.

The treatment is still debatable to a considerable extent. I will not dwell on that.

Among the neonatal deaths and the stillbirths in these cases of toxemia that were investigated at the Chicago Lying-In Hospital, I was impressed with the high incidence of intracranial hemorrhage. It raises the question: Is this due to the same etiological factor responsible for the hemorrhages in the live of the mother?

Another important and practical point it brings up is the fact that it behooves us in these cases to use utmost care in the delivery itself and in any too strenuous or harmful efforts at resuscitation of the baby.

**Henry M. Rutel, Louisville:** I do not think

this paper ought to go by without liberal discussion. I remember when I read a paper on the subject in 1925 at the Southern Medical Society I thought I had a very up-to-date paper, and that I had said the last word, but every year there is some new point brought out. In other words, we don't know much about eclampsia. We do know it has a tendency to a spontaneous recovery, and if we aid nature and not thwart her, the chances are the patient will recover. I think the greatest weapon we have today is in prenatal care.

Dr. Speidel went over those statistics for you. We have them at the City Hospital: 0.43 of 1 per cent of cases that have been under observation developed eclampsia, whereas 2½ times that number that had not been under observation developed eclampsia.

It doesn't make much difference what treatment you use; you may use the Stroganoff treatment—he uses chloroform liberally, while here we wouldn't think of it; he uses chloral hydrate in overwhelming doses and uses bromide of soda and milk per rectum and gets wonderful results, and his mortality is down to 6.5 per cent; you can give this treatment as outlined by Dr. Speidel, that was introduced by Dr. Dorsett and Dr. Otto Schwarz of St. Louis.

Lazard, occasionally had some respiratory trouble following doses of magnesium sulphate intravenously so the group at Barnes' Hospital in St Louis went over to the intramuscular treatment of magnesium sulphate. You use it in either 10 or 20 c. c. of a 25 per cent solution every two or three hours until you control the convulsions. Dr. Standler, of the Hopkins Clinic, says you may use as much as six grams in 24 hours. I think you can use decidedly more than that, but the thing is to outline a good, normal, rational treatment.

I remember some years ago we used to shake that patient up pretty liberally. She would come in and we would give her a gastric lavage, two or three gallons of bicarbonate of soda solution, copious colonic irrigations, then maybe a little morphine sulphate, and then we would hot-pack her, and believe me you had to have some team work to go through with that. It took you one-half to three-quarters of an hour to go through with that regime. Later on, we instituted a more conservative treatment; we didn't bother our patients so much; we kept them quiet and gave them a little morphine. Now they have an injection of magnesium sulphate plus a little morphine as soon as they come in; if they get restless you can give them a little sodium amytal or penta-barbital if the patient is conscious give two or three capsules; if not, give it per rectum.

Another thing Dr. Speidel mentions is Gwathmey's oil-ether per rectum. Lately we have been in communication with the Abbott



Laboratories, and they are now putting out a preparation of nembital 8 grains, neonal 5 grains, and 2½ ounces of ether and olive oil or liquid albolene, qs. ad. 4 ounces. That is another good remedy that may be tried out. We use liberal injections of 20 per cent or 25 per cent glucose intravenously.

In the clinic of Dr. Beck and Dr. May and Dr. Polak, they use extensive venesection, and would abstract as much as 1,000 c. c. of blood.

In one of my last cases I did that; I abstracted about 300 c. c. of blood and the blood pressure dropped to 100. That is the time for you to stop. If you do that you can counter-balance it with 1,000 c. c. of 20 per cent glucose, if the blood pressure drops too much.

Aid nature. Don't try to do too much. In case you have recurring convulsions with a long undilatable cervix, I think that is the prime indication for an immediate Cesarean section.

This treatment is divided into obstetrical, medical as a secondary help, and surgical. In some of the clinics over in Germany, where they get them immediately, whether it is a true eclampsia or not, some of the cases that have been Cesarean sectioned immediately have shown mortality statistics comparable with the best medical treatment, but today the thing is conservative treatment in eclampsia.

When I was a much younger man, at the Lying-In Hospital in New York, we sectioned most of our eclampsia cases and had a high mortality rate. If you can get along under conservative, obstetrical-medical treatment, and get the results that we have, or even a little higher, we should be satisfied until another line of treatment is introduced which can promise us a further reduction in mortality rates.

I think this paper of Dr. Speidel's is most timely. Every year at this meeting where obstetricians and general practitioners are assembled, a paper of this type ought to be given, and it should be given on the second day and not on the last day when everybody is leaving.

We are being relegated to the wrong day. They ought to hear these papers when the greatest number of men are present. I really deplore the fact that so few people are here today to hear this excellent address by Dr. Speidel.

**Edward Speidel**, (In closing): Just one word in conclusion. I think the point brought out by the first essayist is a very important one; post mortems on babies born of women with eclampsia or pre-eclamptic toxemias show cerebral hemorrhages. That is the very reason we now, instead of allowing such patients to go to full term, deliver as soon as the toxemia of the mother is under control, because it is an established fact that the baby, of course, is suffering from the same toxemia that is affecting the mother, and the baby will have the same petechial hemorrhages throughout its organs as

the mother has. The only way to save that baby is to deliver the woman as soon as her toxemia is corrected, so that the baby does not get the added toxins from the dear areas in the placenta.

## HEAD COLDS\*

HARVEY H. ROBERTS, M. D.

Georgetown.

This malady is one of the greatest afflictions to which the human race is heir. It is a disease of civilization being more prevalent in dense population. It appears every year throughout the country in both epidemic and endemic form. It attacks thousands producing a financial loss to the industrial and commercial world of an estimated cost of \$500,000,000.00. It is a menace to society and the business and professional interest of every community.

Very few are immune, it attacks the old and the young, the rich and the poor, the weak and the strong, in fact, most everyone has experienced the pangs of this most distressing disease—Head Cold.

The medical profession realize that a head cold is a condition which should not be treated with indifference. Many serious complications and dangerous sequela frequently follow a seemingly mild attack.

Head colds are regarded by the average layman, as a most insignificant condition. They are not concerned in the least as to the disastrous results which may follow.

They go about their business or make social calls, they attend to their obligations at their clubs, they even attend Church, or go to the theatre and movies and many other public places where large numbers of people assemble, spreading infection to all with whom they come in contact.

Some individuals are readily insulted, if the slightest protest is made against their sneezing or coughing in one's face, or down the back of one's neck. This habit is general, it is nothing unusual to see some individuals blowing their nose upon the streets, or expectorating in public places, spreading disease producing germs. An attempt of the physician to discourage such habits, is met with resentment or treated with utter indifference.

It is a serious problem to decide just how far the medical man can go in giving free advice in the prevention of the spread of disease. It is a question of vast importance to every physician and one to be met only, by the co-operation of the Health Authorities and careful education of the public.

\*Read before the Scott County Medical Society, December 3rd, 1931.

Frequently one may see individuals going about the streets with an ozema of the most offensive character, with his woody voice, declaiming "I's dot a bad tol fy mak uch a fus ober a lit'le fing."

The nose being an internal organ with an external exposure, it promptly becomes the abiding place for swarms of all kinds of germs, dust, smoke and other deliterious substance. The nose is the open door, through which may pass with every inspiration, millions of disease producing germs.

Head colds confined to the nasal passages are termed acute rhinitis or coryza. Should the infection extend to the sinuses, there will develop the various sinusitis. The infection may extend further down, causing pharyngitis or laryngitis. It may advance to the bronchial and lung tissues, producing bronchitis or broncho-pneumonia. There are other sequela causing more serious injury to health.

Empyema in various cavities of the body, also brain abscesses and mastoiditis followed by meningitis are frequent dangerous complications, following the infectious micro-organisms resulting from a head cold.

Ethmoiditis is a serious situation, due to the danger of necrosis following frequent attacks of head colds. The maxillary sinus may give rise to painful and alarming symptoms. Chronic sphenoiditis is a distressing and annoying condition on account of the dropping back into the throat of purulent discharge. It is also very intractable to treatment. Serious inflammation of the eyes have resulted from extension of cold infection. This is especially true of the untreated cases.

With the copious discharge there are thousands of germs and pus-cells floating in the serum of the submucous membrane, which may be carried by the lymphatic and blood stream to remote parts of the body, infecting the heart, gall-bladder, kidney and other vital centers.

Seventy per cent of the heat of the body passes out through the skin, the rest follows the air passages. Any sluggishness of the heat elimination will cause impairment of the air passages producing congestion of the nasal mucosa, resulting in systemic disturbances as chilliness, fever, pain and general depression. All of which is caused by the stoppage of the normal avenue of egress.

#### WHAT IS THE CAUSE OF HEAD COLDS?

This question has been asked countless times of every physician. There are millions of micro-organisms present in the secondary stage of every head cold, there may be found the influenza bacillus, streptococcus, pneumococcus, staphylococcus and the catarrhalis micrococcus and many others, but a specific

germ for producing head colds, has not as yet, been discovered. With the many organisms found in the nasal passages the leading bacteriologists are agreed that a specific organism has not been found. It is true there are many claims, but the real bug has kept itself concealed. All agree that the other organisms present are secondary to the disease. They do not appear at the beginning of the attack.

I do not believe it is possible to contract a head cold, without some well defined systemic condition is present, such as a sudden chilling of the body, or some toxic condition causing depression and loss of resistance.

A sudden chilling of the body, may result from over-eating, severe mental depression, or undue exposure while in a state of perspiration, will lower the resistance and invite congestion of the nasal passages. The congestion and out-pouring of the sero-mucous is fertile soil for the entrance of countless, countless micro-organisms which are always in the surrounding atmosphere.

Any condition that will disarrange the mechanisms of the neuro-vascular system will lower the resistance of the respiratory function and bring about a congestion. Atmospheric changes and conditions of temperature are perhaps the most frequent source for the beginning of a head cold.

I believe the most frequent cause is some toxic material within the gastro-intestinal canal. Faulty elimination, imprudent diet, over eating and exposure to cold atmosphere while in perspiration will almost invariably result in congestion of the nasal passages.

Frequent head colds will cause chronic catarrh or result in the development of various sinusitis. Frequent head colds in children are the forerunner of Adenoids, diseased tonsil and middle ear disease. Rheumatism may result from extension of the infection by the local focal point of habitation.

Appendicitis may have its origin from the chronic seat of micro-organisms of an old sinusitis. Pvelitis, persistent headache, frequent sore throat may receive their infection some chronic conditions resulting from head colds. Acute peritonsillar abscess, retro-pharyngeal abscess and other suppurative conditions of the tonsils and pharyngeal tissues, are the result of lowered resistance and the extension of various micro-organisms from some focal point of infection.

Preventive medicine is the general tonic before most every medical organization at the present time. Modern Hygiene is that useful part of science, seeking to educate the layman how to use the most modern means and methods for the betterment of health and the prevention of disease.

Everyone is anxious to avoid sickness and



to defer old age! Prevention in any form of disease, is often more satisfactory in results, than an attempt to make repair.

Existence in this life is a continual fight against the things that cause illness and those methods which will insure better health. It is a matter of regeneration and degeneration, the latter usually predominates.

When we consider the presence of millions of disease producing germs, seeking to exterminate the human race, there is little question as to who will win in the end.

There are various city ordinances, National sanitary laws, our local and State Health boards who are supposed to rectify any injurious condition which will cause ill health in the community. Why are these ordinances and laws not enforced? Is it that the officials do not consider such protection of sufficient importance to enforce the law? So the spread of disease goes merrily on! I have reference to head colds, especially.

We have a city and state law against expectorating in public places. It is not enforced! If one must sneeze they should use a handkerchief, if they must expectorate, then use a cuspidor or handkerchief. The habit of coughing in the open is a deplorable crime against modern sanitation.

Further prevention should be exercised in adequate ventilation of the homes, bedrooms, school rooms, halls and all public places.

The selection of proper diet for those who are susceptible to frequent head colds, that better resistance may be established. Systematic out-of-door exercise should be encouraged. Wearing of proper clothing, that will prevent chilling of the body and keep the body warm, without inducing perspiration. The wearing of the same weight of underclothing throughout the year is a splendid preventive of head colds.

Over-heated homes and the wearing of too heavy clothing is a crime against health. Proper wraps and overcoats should be worn to meet the changes of weather. Excessive heavy cotton underwear producing perspiration, keeping the skin moist is a potent means of producing head colds.

Silk is a popular material for those who can afford it. Light wool and linen mesh are perhaps the best. These give warmth, absorb the perspiration and are light in texture.

The habit of going bare-headed should be discouraged, as it is one of the most active influences for producing chronic catarrh, mastoid infection and countless other injurious results.

The use of fur caps, neck scarfs, mufflers, leather vests, and chest protectors are a constant means of developing head colds. The

sudoriferous glands of which the neck has an abundance, should not be covered with any heavy material. Such a custom predisposes to congestion, weakens the parts and may cause the very condition which is sought to prevent.

The most essential prevention of head colds is to make a careful examination of the nasal passages for any obstruction which may predispose to head colds and remove same that free air passage may be secured. The removal of spurs, enchondromas, deflected septum, hypertrophied turbinates or other abnormal conditions is most essential for preventing head colds.

Systematic and thorough drainage of any infected sinus, the removal of polypi growths, adenoid tissue or any other interference with correct breathing should be corrected.

Every head cold, no matter how mild it may seem, should be promptly and continuously kept under observation until the infected area has healed. Neglected and frequent head colds invite chronic sequela with all their distressing and dangerous results. One of the most common complications is the infection of the Eustachian tubes, often seriously impairing the hearing, or the establishing of annoying head noises.

I am convinced that the intestinal tract is responsible for a majority of head colds. A heavy meal late at night of cheese, winnies or hot dog, with plenty of mustard will cause congestion of the mucosa of the nasal passages.

Any clogging of the intestines will produce congestion of the nasal mucous-membrane, especially so, if there is a chronic sinusitis present. Any toxic material within the system will frequently cause a chronic sinusitis to flare up, resembling a head cold.

#### HOW SHALL WE PREVENT HEAD COLDS?

During the interval of those who are subject to head colds, everything possible should be done to harden the body and build up resistance. After removing all local exciting causes from the nasal passages, attention should be directed to any underlying condition that may be in the system.

Due consideration should be given to those subjects who have asthenia, or low blood pressure and run sub-normal temperatures. Hardening of the system and increasing the resistance and re-establishing immunity, by fortifying the glandular system by the judicious use of the Hormones is good practice.

Systematic sponging of the chest every morning before dressing, with cold water and a vigorous rub, has a special beneficial effect for hardening the body. This form of bathing is not only invigorating but produces a sense of well being all through the day. Everyone who is so unfortunate to contract

a head cold, should at once consult their physician.

#### TREATMENT

Alkalization of any acid intoxication, which may be present.

Through elimination of the system by a brisk cathartic at the onset, followed by an active saline. I regard a dose of calomel, three grains with soda bicarbonate, three grains, as the best, followed by a dose of Epsom salt. Rest indoor, keeping the body warm and avoiding drafts. The diet should be light and free from all nitrogenous foods. The old adage, "Feed a cold and starve a fever," is essentially wrong. Hot-packs, hot drinks are good to relieve the congestion by inducing perspiration and assisting to re-establish the normal circulation in the nasal mucosa.

Anodynes should be used as indicated for pain and restlessness. Peralga is useful and gives marked relief without any depression. Cinchopyrine, Salicin and other forms of the salicylates should be given as required. Disulphamine has proven worthy of use in head colds due to its medicinal value in toxemias and septic conditions. Omnadin is one of the most useful remedies for stimulating the defensive powers of the organism. It increases immunity against infection in general and often aborts a cold or causes it to run a milder and shorter course and prevents complications. Optoclin base is useful for preventing the complication of pneumonia.

I know of nothing more harmful in the treatment of head colds, than the indiscriminate use of certain advertised drugs. Some of the announcements over the Radio are not only ridiculous but a serious travesty upon truth. Their claim for antiseptics is unreasonable and a reflection upon the integrity of medical science. Most of these preparations are heart depressors and dangerous from their injurious effect upon the nervous system, as well as the digestive tract.

The use of quinine and the cinchona alkaloids should be discontinued on account of damage to the hearing, producing serious inflammation of the ear, and causing annoying head noises.

The use of sprays, swabs, douches and irrigation and other methods of washing the mucous membrane, at the beginning of a cold is injurious, often carrying infection to deeper parts.

In the secondary stage, careful irrigation with a mild alkaline solution is soothing and productive of much good. The use of some of the Ephedrine is useful in shrinking the swollen tissues before irrigation. The too frequent and too long use of Ephedrine

is injurious. At the beginning of a head cold, the use of Ephedrine Merthiolate is beneficial. This should be followed by a ten per cent solution of argyrol or neo-silvol, ten drops placed in each nostril every three or four hours, by means of a medicine dropper. Nebulizing with a one per cent solution of menthol, camphora, oil of pine and liquid petrolatum is healing.

I believe the use of antiseptic remedies are useless at the beginning, in local treatment, of head colds. After the secondary stage is reached, when the greater number of microorganisms are in the deeper layers of the mucous membrane, the Bacterial vaccines, and Sero-bacterins will be useful. The use of autogenous vaccines in multi-infection is a sheet anchor in a storm of great intensity.

In the use of bacterial vaccines, there is always the danger of the patient losing all of his protection through Anaphylaxis from the bacterines.

Allonal or sedormid are useful for producing restful sleep. The solution of Organic Iodine, for building up resistance is very useful, it should be given in ten drop doses in a glass of water before meals. This preparation is also, beneficial during the attack.

#### CONCLUSION

Careful examination of the nasal passages and the removal of all abnormal obstruction.

Build up resistance and harden the body to establish immunity as far as possible.

Through elimination and active diaphoresis with careful guarding against undue exposure.

Better co-operation with the Health Boards for rigid enforcement of all sanitary laws.

Thorough and systematic education of Hygienic principles, and more careful examination of the patients, for correct diagnosis will do much to lessen head colds.

**Uranium-Thorium Colloid in Treatment of Carcinoma.**—Eight cases of carcinoma were treated by Pack and Stewart with intravenous injections of uranium-thorium colloid after the manner recommended by Hocking. In only one patient was there evidence of temporary benefit as judged by the disappearance of certain skin metastases from a breast carcinoma. In the case the improvement was transient and there was no evidence that life was prolonged or that there was any definite palliation. In the remaining seven cases there was no evidence of improvement of any sort following the treatment. In two patients the colloid was possibly nephropathic, although no necropsies were performed for confirmation. In two cases, necropsy revealed that the uranium-thorium colloid was deposited in the Kupffer cells of the liver and in the splenic reticulo-endothelial apparatus.



# SOME POINTS IN THE TREATMENT OF FRACTURES OF THE EXTRE- MITIES\*

E. W. NORTHCUTT, M. D., F. A. C. S.

Covington

The different types of fractures of the extremities and the methods of handling them are so numerous that even brief mention of them all would make this paper entirely too long and practically valueless. It will, therefore be limited to just a few points that I consider of some importance in the care of these cases which are daily increasing in number.

Since the advent of the automobile, fractures have increased enormously and, I believe the percentage of complications has also increased.

No attempt is made to minimize or underestimate the value or success of any other method of treatment. Each method must have been satisfactory in the hands of some one or he would not have written about it. To begin with, every fracture should be considered an emergency until it is proved not to be. This is especially true in the upper half of the limb where damage to the large vessels is more serious.

After the usual first aid has been rendered, such as the treatment of shock, control of hemorrhage and temporary immobilization as may be indicated, comes the problem of securing for the individual the best results in the shortest possible time.

In my opinion, every fracture should have

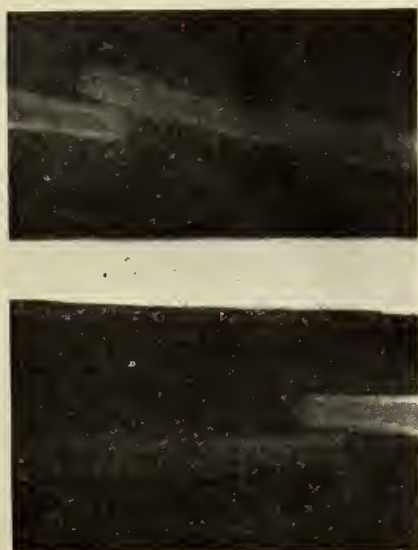


Figure I a

Position of fragments on admission

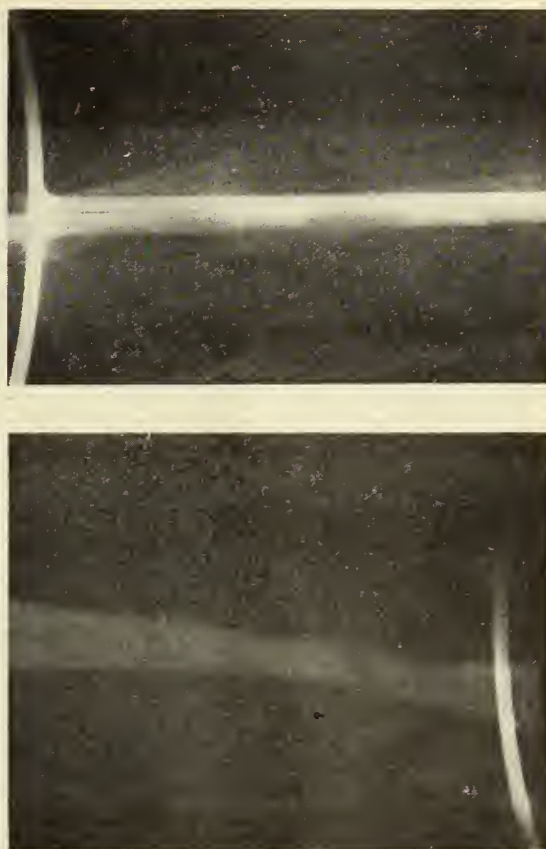


Figure I b

Position after second attempt at closed reduction

an x-ray picture made of it before and after reduction, and repeated as often as indicated during the progress of the case. It gives at once a definite working basis by showing the type of fracture, and the relation of the fragments. If this is done, one will occasionally be very much surprised what a different picture the x-ray shows, from the mental one he had. It also serves as a permanent record and, may save an embarrassing situation later. Without it one is forced to admit he did not know just the position of the fragments and, a persuasive lawyer can make this sound very bad before twelve men and women. To make a picture is simply giving the patient the best which is proper.

The points I should like to discuss in the handling of these cases are the anesthetics used and the methods of immobilization.

Before reduction is attempted a very careful examination should be made for nerve injury. If this is found to be present, open reduction with necessary care of the nerve is indicated. The nerve may have only been pinched between the fragments, or it may

\*Read before the Campbell-Kenton County Medical Society

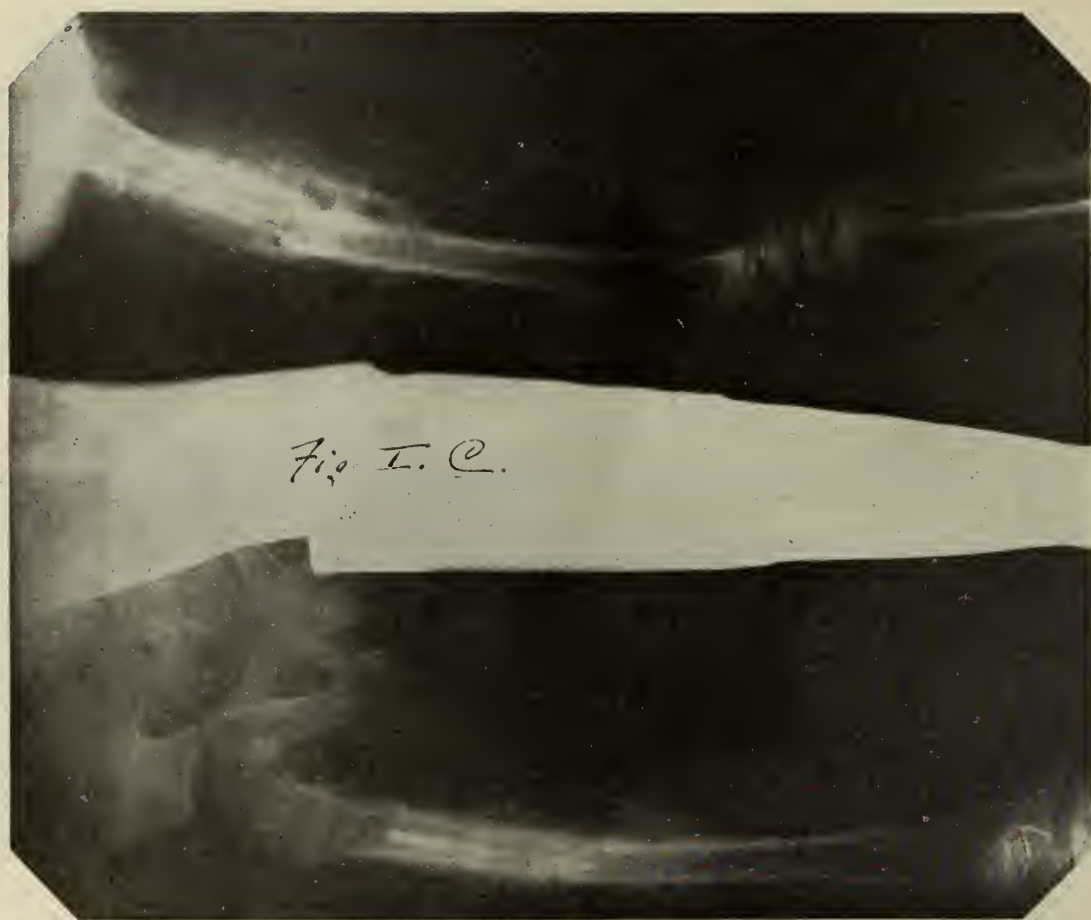


Figure I c

Position several months after open reduction showing end to end apposition with good callus formation

have been completely severed. If the limb is put up, and a severed nerve has been overlooked, an operation will be necessary later; the operation will be more difficult and valuable time will have been lost.

In fractures of the upper extremity a local anesthetic when ever possible is the one of choice. It can be used in nearly all cases even in small children and in many compound fractures. Some of the advantages are (1) it avoids the danger of a general anesthetic, which may of itself be considerable. For example, the patient may have a respiratory infection or he may have sustained other injuries that would contraindicate a general anesthetic; he may be old and feeble and very often will have a full stomach, which may at least be disagreeable to all concerned; (2) a patient who is conscious can often actually assist in the reduction; (3) if properly given, and if we wait long enough before the manipulation,

there is no pain, and relaxation is more complete than with almost any general anesthetic; (4) the anesthetic lasts long enough for one to examine the fracture under the fluoroscope or even make a picture and, if the position is not satisfactory it can be manipulated again without more anesthetic being injected; (5) it is easy to use. In injecting the anesthetic no attempt is made to locate the nerve as this is entirely unnecessary. With a fine needle a wheal is raised on the skin over the site of fracture, this makes the injection almost painless, and strengthens the patient's confidence in the procedure. Next a longer—larger needle—depending on the size of the limb—is attached and inserted through the wheal; a little of the solution is injected as the needle is advanced—until it is thought the fracture has been reached. The piston is then withdrawn slightly, and if blood appears in the syringe the injection may be made. It may be well to change the position



of the needle slightly several times during the injection so that should the needle be in a vein all the solution will not be injected into it, however, I believe this to be rather a remote possibility. After waiting five to ten minutes (by the clock) both patient and doctor will often be surprised to see with what ease and freedom from pain the fracture may be manipulated.

After reduction comes immobilization. There are all kinds of patent splints on the market which salesmen explain in great detail mechanically, anatomically and physiopathologically and urge the doctor to use. If the doctor uses them, and is not very careful he will find himself unconsciously trying to fit the fracture to the splint. My preference is a perfectly smooth plaster of Paris splint placed directly against the skin, molded to the arm in the desired position held there by a bandage. Care must be exercised in applying the bandage, not to get it too tight, but just snug enough to hold the splints in contact with the skin, at all points. This kind of a splint is always available, it can be made to fit any arm, it is simple, it

is easily applied, and stays in position, it is cheap, and in my opinion it is the best.

I use an anterior and posterior splint, though it may not always be necessary. In making splints the edges should be turned back a little to prevent them from digging into the skin. In applying them the fingers should not be included, this will allow the patient to move his fingers almost from the beginning, and by the time the splints are removed he will have practically normal use of them. I have seen a case of simple Colle's fracture, in which a straight wood splint was applied including the fingers—and left on for several weeks. Nearly a year later the patient was still under treatment to regain use of the fingers. It may be necessary to have the patient elevate the arm at intervals to prevent swelling and, it should be explained to him why this is necessary.

The splint should be removed, the limb given light massage and a little active motion started as soon as consistent with safety in the particular case, and the splint re-applied. It is not practical to go into these details here.

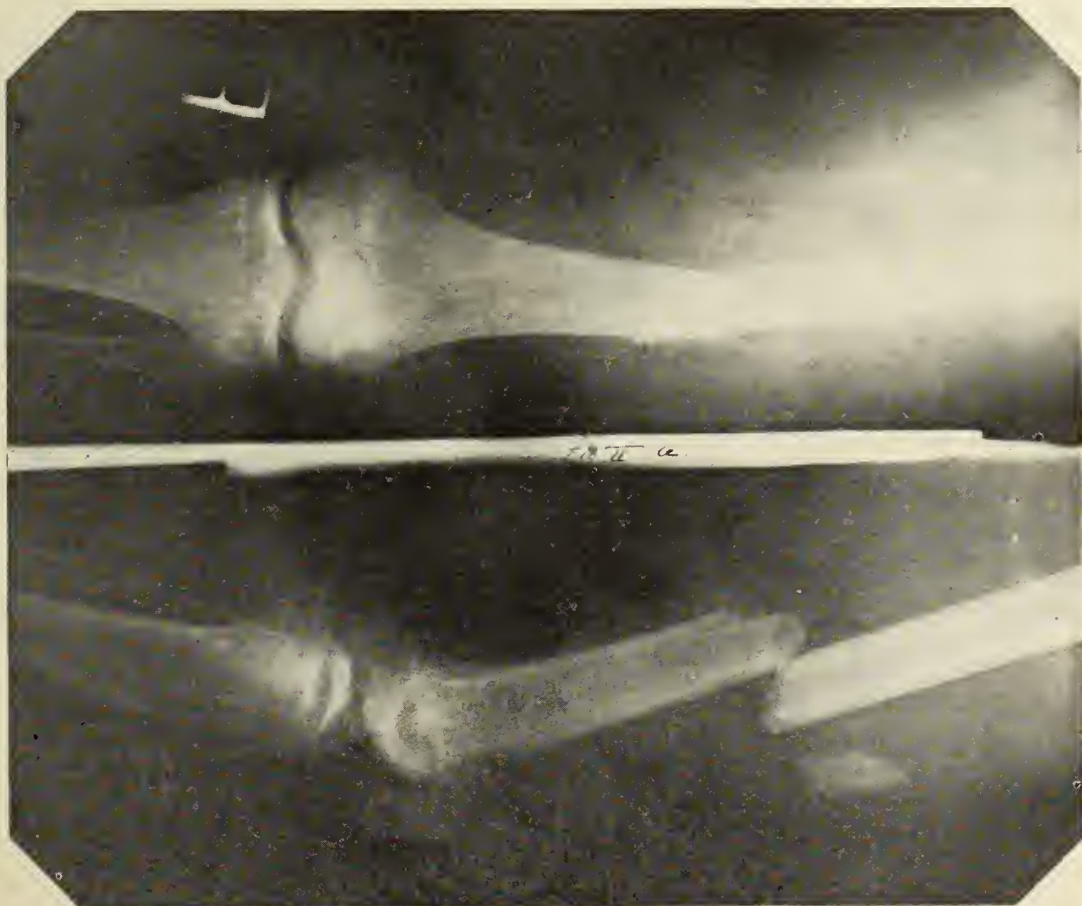


Figure II a  
Position of fragments on admission



Figure II b  
After attempt at closed reduction

In fractures of the lower extremities much that has been said of fractures of the upper extremities applies. However, there are a few points that may be especially mentioned. The anesthetic must be considered. Of course in some cases none is necessary. But in a case of marked deformity, and overriding complete relation is essential. This in a muscular individual requires a profound general anesthetic. This is one reason why in such cases I prefer local or spinal when practical. I do not believe it is possible to get the same degree of relaxation with the ordinary anesthetic that can be obtained with a local or spinal. Here again the patient is conscious, and can often be of some assistance during the manipulation of his fracture, for example he can keep himself in position on the Hawley table, or if the ordinary operating table is being used, he can grasp the sides of the table, and aid materially in making countertraction.

The question of immobilization and retention of fragments is too extensive to be discussed in any detail here. Generally speaking the simpler the apparatus, the better it

is, if it does the work.

In fractures below the knee, the molded plaster splint applied directly to the skin, and held by a bandage, is often very satisfactory. This method however is not applicable to fractures above the knee. And it is here that we enter that maze of methods and appliances too numerous to mention. Some of them are almost too complicated and cumbersome to use on a sound limb. When I see a lot of pulley, weights and counterweights about a fracture bed, there comes over me a feeling of uneasiness, and the more there are the greater the uneasiness.

If a fracture cannot be properly reduced after a fair trial, or if the fragments continue to become displaced there should be no hesitancy in resorting to open reduction. The buga-boo of infection in open reduction is rapidly becoming dissipated. Certain fractures should be reduced by the open method primarily, that is, without any attempt at closed reduction. Among these may be mentioned some of the fractures of the upper end of the radius, fractures of the lower third of the femur with bad posterior displacement of the lower fragment, some of the fractures of the lower end of the humerus, and certain fractures of both bones of the forearm and fractures of the olecranon process with wide separation of the fragments.

The method of internal fixation is largely a matter of choice with the individual operator. Occasionally it may be necessary to only place the fragments in position and apply a light cast.

I should like to show the x-ray pictures of and mention very briefly two cases that illustrate a type of fracture occurring rather frequently and often requiring open reduction. Case I—fracture through the middle third of the femur with posterior displacement of lower fragment and over-riding.

Figure (1) a. Position of fragments on admission.

b. Position after second attempt at closed reduction:

c. Position several months after open reduction showing end to end apposition with good callus formation.

Case II—Communitated fracture through the lower third of femur with posterior displacement of lower fragment, and over-riding.

Figure (2) a. Position of fragments on admission:

b. After attempt at closed reduction:

c. Two days after open reduction.

In each of these cases there was marked damage to the soft structures with interposition of large bundles of muscle. There is no way of knowing these facts when the



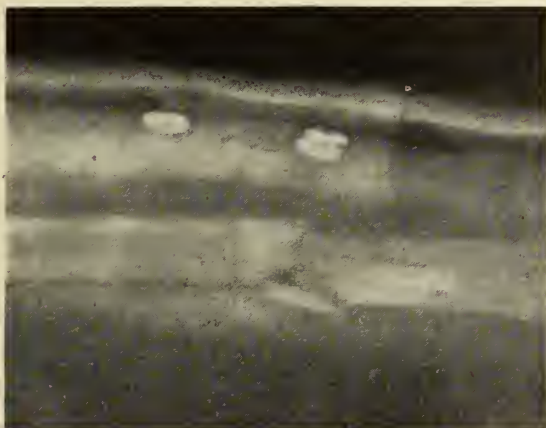


Figure II c

Two days after open reduction.

closed method is used. In such cases I believe continued efforts at reduction by the closed method is too difficult and dangerous to be justified.

**Surgical Treatment of Pulmonary Tuberculosis.**—Decker feels that surgical therapy, by artificial pneumothorax, phrenicectomy and thoracoplasty, is a great boon to many individuals who are otherwise doomed to die of pulmonary tuberculosis. In about 40 per cent of the patients subjected to operation, recovery will be assured; in 25 per cent, improvement will be effected. In the selection of cases for operation, each must be chosen on its own individual merits. Surgery should always be used as a supplementary procedure. After operation it is essential that the routine regimen for tuberculosis be continued until recovery has taken place. Of nineteen patients on whom he did a thoracoplasty, plus a phenicectomy in seven, seven were markedly improved and five were improved. Six died and one showed no improvement.

REPORT OF THREE CASES OF GASTRO-INTESTINAL HEMORRHAGE\*

J. A. O. BRENNAN M. D.  
Louisville.

Case No. 1. M. W., female, white age 12 years.

History. Patient was admitted to St. Anthony's Hospital, August 27, 1931, complaining of pain in the stomach, nausea, vomiting, severe frontal headaches and bleeding from the nose. Patient was in a stuporous condition and I was unable to get any kind of a response.

Physical examination was essentially negative with exception of enlargement of spleen and liver, and slight distention, with some tenderness throughout, the abdomen.

Laboratory Work. Urine: 8-27-31, yellow, neutral, 1010, albumen trace, sugar negative, few white cells, diazo—reaction positive.

9-3-31, yellow, acid, 1014, albumen negative, sugar negative, several white cells.

BLOOD:—

	8-27-31	8-3-31	10-8-31
R. B. C.	3,170,000	39%	68%
Hemoglobin	65%	1,910,000	3,400,000
W. B. C.	3,250	4,250	7,950
Staff	11%	8%	7%
Polys	61%	52%	49%
Lymphocytes	39%	43%	48%

Widal, Typhoid Bacillus, strongly positive.

On admission, patient's temperature was 103° F., pulse 118, respiration 22. We were unable to get her to take food in any quantities; she would take 3-oz. to 4-oz. of buttermilk and that was all. That night she vomited 1-oz. of bright red blood. The following morning she vomited large quantities of dark red blood. On August 28, patient defecated a large amount of dark red blood containing blood clots. She was still stuporous.

Venoclysis was started and run for six days. She received an average of 1504 c. c. of 10% glucose every 24 hours; the highest intake being was 2400 c. c. the first 24 hours and the lowest 500 c. c. the fifth 24 hours.

Besides that the patient took an average of 1060 c. c. of water every 24 hours.

At the end of six days, patient was able to take beef juice, lemon, albumen, jello, and enjoy it.

Patient made an uneventful recovery and left the hospital on the twenty-first day.

Case No. 2. J. O., male white, age 60 years, occupation, carpenter.

Admitted on August 8, 1931, operated day of admittance. The intestines in region of appendix were found to be acutely inflamed. Patient did well until ninth post-operative day, at which time he had a severe chill which lasted 30 minutes, profuse diaphoresis

\*Read before the Jefferson County Medical Society

entire day and night, and another bad chill in the afternoon. On Wednesday, August 19th, the eleventh post-operative day, patient began to pass blood by bowel. He had another chill Thursday morning with profuse sweating following, and continued to pass bloody mucus in stools. On Sunday, the fifteenth post-operative day, patient passed a large amount of bright red blood. He had three more of these hemorrhages within 24 hours, the amount ranging from 4-ozs. to 10-ozs. Had two more chills before Tuesday. Patient was given intravenous glucose, but had a reaction after each administration. Blood culture revealed a strong strain of paratyphoid "B." Patient was put on 10% glucose solution by venoclysis with morphine to stop peristalsis, on Thursday, August 27th; one ampule of calcium gluconate was given with each 800 c. c. of glucose solution. Patient began to improve steadily. He had no more chills, and no more intestinal hemorrhages. Venoclysis was discontinued on September 1, 1931. At this time patient was eating regular diet, with no hemorrhage from bowels, and was improved in every way. He continued to improve; and on September 12, 1931, the thirty-fifth post-operative day, was sent home in good condition.

Case No. 3. G. S., male, white, age 27 years, was admitted to St. Anthony's Hospital, September 21, 1931.

This patient was sent to the hospital, from the country, with a diagnosis of malaria. He is married. Occupation, farmer.

Physical examination was negative, including the blood and urine. His chief complaint was of headaches, but these headaches were not frequent. After admittance to the hospital, patient had an occasional vomiting spell and headache. X-rays, of lungs and stomach were negative. A gastric analysis was done and it revealed the absence of hydrochloric acid; no blood was present at this examination. Blood sugar was negative. Wassermann was negative. On October 1, 1931, patient had a severe gastric hemorrhage and later from the bowels. He vomited blood during the day.

Venoclysis was started of saline and 10% glucose. A blood transfusion was also given of 480 c. c. of citrated blood per venoclysis; a slight reaction followed this. The following day, it was noticed that patient had unequal pupils and ptosis of the right eye. He was in a stupor for practically 30 hours. The first spinal puncture showed high pressure and a number of cells (66); globin normal: spinal fluid examined for lues, negative. Colloidal gold test for lues was negative. Patient remained in this condition for about six days. Multiple spinal punctures revealed

heightened pressure, and on each occasion pressure was relieved. Dr. Gaylord Hall and Dr. Hugh Richeson saw this young man in consultation and they wrote as follows: "Has double optic neuritis and veins swollen. Has grayish exudate around both nerves. Has retinal hemorrhages in right eye near disc and one large hemorrhage near macula region in left eye." This patient was given all medication through the venoclysis, such as calcium gluconate and sodium iodide. The venoclysis was continued for approximately six days and then was discontinued, since patient gradually improved to such an extent that we thought it advisable to stop it. No food and no liquids were given by mouth during this time. Later patient was put on a modified Sippy treatment and a corrected diet.

Patient left hospital on November 17th after having been in the hospital fifty-seven days. He was greatly improved and apparently in normal condition.

Diagnosis, gastric ulcer, although the x-ray was negative. Diagnosis was made upon finding blood in gastric analysis and from severe gastric hemorrhages.

I am unable to explain the cause of the intracranial pressure and the ptosis of the right eye.

#### DISCUSSION

**Gaylord C. Hall:** Doctors, I saw this third case with Dr. Brennan. This boy was complaining of double vision and very much blurred vision. As Dr. Brennan detailed, we found that he had a complete involvement of the right third nerve; dilated pupil and retarded ocular movements; and in addition to this, multiple hemorrhages were present in both retinæ, and there was a distinct swelling of both nerves. We were unable to connect the patient's symptoms that he was manifesting in the eyes and brain with his gastro-intestinal symptoms, and we still think we have not shown any causal relationship between the two.

I think Dr. Brennan is to be congratulated upon the recovery of this boy. The swelling of the nerves subsided and paralysis of the third nerve cleared up. I did not get a chance to test this patient's vision in the office or to take his visual fields, so I can not give you his vision at the present time.

**George A. Hendon:** Mr. President, in discussing Doctor Brennan's paper, I should like to call attention to a very important alternative effect that takes place in the gastro-intestinal tract when its function is totally suspended without incurring the evil effects of dehydration or partial starvation. Those of you who become sufficiently interested, I am sure will be astonished at the results. This alternative factor does not become evident when only partial suspension of function is accomplished: it



is only when all the natural exercises of the alimentary tract are completely halted, that this unusual phenomenon occurs. I have been particularly impressed with this fact in observing cases of peritonitis, gastric intestinal hemorrhages, and a series of fourteen peptic ulcers that I have treated in this way. It can be done so easily and so safely and can be continued over any period of time one may wish, without exposing the patient to danger or great discomfort, I am sure the method will recommend itself as one of the most valuable remedies that has been added to our equipment in modern times.

#### INTUSSUSCEPTION IN A CHILD FOUR MONTHS OLD\*

JAS. W. BRUCE, M. D.

Louisville.

This case which I saw recently made a deep impression upon me.

Patient, the first-born baby of healthy parents, four months old, breast-fed, never having been sick and in a splendid state of nutrition, had a violent crying spell about seven o'clock one morning. The family physician was called and could find nothing the matter with it and prescribed bromide. The mother had given the child a dose of castor oil on her own initiative. About three o'clock that afternoon the baby began to pass blood from the bowel and I saw it in consultation with the family doctor. We made a diagnosis of intussusception and had the baby on the operating table at six o'clock, eleven hours after the onset of the symptoms, at St. Joseph's Infirmary. By that time the intussusception mass had gotten down to within a short distance of the rectum, the mass being palpable upon rectal examination. The intussusception was reduced with great difficulty but was finally gotten out. The child did not pass gas or feces for forty-eight hours after the operation, in the meantime becoming tremendously distended and vomiting continuously, and it was necessary to introduce a nasal catheter to relieve the gaseous distension. Temperature 103; pulse 160 and the child was in extremis; I did not believe it could last more than twelve hours longer. Then, at the suggestion of the surgeon who had operated, 25 mg. of novocaine was injected intraspinaly and within ten minutes the child was passing gas, and in ten hours the belly was flat, and for the time being the child was in very good condition. I did not see it again for two weeks and then in consultation with the attending physician. The child had run an intermittent fever since the original operation for which no cause

could be found. The next morning the stay sutures were taken out and the wound burst open and the intestines came out. They were put back into the belly, the wound resutured, and the child's temperature went to 106 and it was dead in half an hour.

Autopsy showed absolutely nothing except beginning fatty degeneration of the liver. The heart and lungs were absolutely normal and there was no evidence of anything that could cause the fever that we could discover.

I report the case for two reasons; first, it presented the most dramatic effect of spinal anesthesia on paralytic ileus I have ever seen and, second, it was unusual because of the fever for which no cause could be found. We wondered of course, if it could not have been of liver origin.

Dr. J. R. Peabody: Was the wound infected?

Dr. J. W. Bruce: No, sir.

Dr. Wallace Frank: What made it burst open?

Dr. J. W. Bruce: It never had healed; there was absolutely no sign of healing.

Dr. J. W. Moore: What has been your experience as to the cause of intussusception in these children?

Dr. J. W. Bruce, (in closing): I do not know that I can say what causes it. It nearly always occurs in children less than a year old and the location is practically always in the ileo-cecal valve. It is supposed to be due to the fact that the ligaments are rather loose and the ileo-cecal valve goes on through without much to obstruct it. This was that type of case. There was no evidence of a diseased condition of the peritoneum or a peritonitis. At autopsy the ileo-cecal valve was in perfect condition.

It would be interesting to hear some of the surgeons discuss the mechanics of what happened when the valve began to pass gas after the introduction of the spinal anesthetic. I heard Dr. Spurling talk about this phase of the subject and he suggested that the injection of the spinal anesthetic paralyzed the splanchnodilator system thus allowing the vagus-contractor mechanism full play, which contracted down and gave tone to the gut. Apparently in this case the dilator mechanism was inhibited by the spinal anesthetic, the gut contracted down and the child began to pass gas and feces; in fact, it had a diarrhoea two or three days later.

\*Read before the Louisville Medico-Chirurgical Society.

## TRICHINIASIS, REPORT OF CASE\*

HARRY S. FRAZIER, M. D.

Louisville.

This patient I first saw about twenty-two months ago and she still shows a definite eosinophilia of about nine per cent. Another interesting feature of the case is that I was successful in demonstrating the parasites in the blood stream. I took about 5 c. c. of blood and mixed it with 100 c. c. of acetic acid centrifuged it and succeeded, after a lot of looking, in finding several of these parasites. The diagnosis was confirmed in another unusual way by Dr. Cury Martin, who sent some of the blood serum to Dr. George Bachmann, formerly of Johns Hopkins University, now of the University of Porto Rico, at San Juan who did something like a Wassermann test and reported a positive reaction.

This was a young Syrian girl who, when I first saw her, had a temperature of 102, with vomiting, abdominal pain and marked oedema of the eye-lids; she did not have a diarrhoea. As to the etiology, she had eaten some country sausage several days prior to the time I saw her, as had also several other members of the family, none of whom was affected. However, she said that she had prepared herself a second portion of the sausage and, being in a hurry, had probably cooked it insufficiently.

This case could be divided into two phases; the first, lasting ten days, with a temperature of 102 to 105; eye-lids swollen and puffed out, the patient being very sick indeed; and the second, or typhoid-like stage, with a temperature varying from 100 to 102, the oedema in the face having subsided, but with oedema of the feet. During the convalescent stage, which the patient entered after about two weeks, she felt pretty well except for a great deal of muscular soreness and stiffness and she had to walk with a cane.

The first blood count showed an eosinophilia of 18%; five days later, 36%; a week later, 38%; a month later 18%; a year later 12%, and the other day, twenty-two months after I first saw her, 8%.

I have been particularly interested in this case in observing how long after an attack of this kind the patient will continue to show an eosinophilia count, and I intend to watch her and see how long it continues.

## DISCUSSION

**John W. Price:** I have only seen one case of trichiniasis in a patient that I saw with Dr. Flexner at Norton Infirmary a number of years ago. This patient had symptoms similar to those

in Dr. Frazier's case, excessive oedema of the eye-lids, swelling of the ankles, muscular tenderness, and so on. I believe Dr. Flexner predicted that this patient would die, but I do not know whether this prediction was fulfilled.

I would like for Dr. Frazier in closing to say what is the mortality in these cases.

**H. S. Frazier,** (in closing): As to the mortality in these cases, I think it is rather high, something like twelve to eighteen per cent.

There does not appear to be any uniformly satisfactory treatment. If the patient is seen early enough, washing out the stomach and giving thymol or some other vermifuge or anthelmintic would be worth while. The administration of thymol in cod liver oil, intramuscularly, has been recommended. Salvarsan and other arsenical preparations are supposed to be of benefit. I gave this woman sodium-cacodylate and she got well.

## AMIDOPYRINE ANALGESIA WITH AND WITHOUT MAGNESIUM OXID\*

WILLIAM G. WESTON, M. D.

Louisville.

From the Department of Physiology and Pharmacology and the Department of Medicine, School of Medicine, University of Louisville, Kentucky\*\*

The studies of Barbour, Winter and others (1) upon the absorption of magnesium oxid and chlorid in animals and man, as well as on the effects of magnesium upon the antipyretic action of various drugs, have led to numerous clinical trials of magnesium combinations with antipyretic-analgesic drugs. Recently, Simon (2) has reported, for example, that for many individuals the addition of magnesium oxid reduces the amount of acetylsalicylic acid necessary to produce a given degree of analgesia.

Combinations of amidopyrine with magnesium chlorid in rabbits were found by Barbour and Winter (3) to exhibit antipyretic potentiation. Diminished toxicity in mice was also reported. It, therefore, seemed highly desirable to compare clinically amidopyrine analgesia with and without some compound of magnesium. In the present study magnesium oxid was employed. The two drugs compared were amidopyrine and a mixture of equal parts of amidopyrine and magnesium oxid.

\*The combination was given in the form of "Magnepyrene."

\*\*In co-operation with Pharmaceutical Division of the Calco Chemical Company, Bound Brook, New Jersey.



The work was all done on patients in the Louisville City Hospital, and all tests regarded as true comparisons were done on the same subject. The interval between such comparisons was usually one or two days, sometimes longer. The types of pain treated included, especially, headache, arthritic pains and neuralgia. Although the pains were of varying degrees of severity comparisons were only made under conditions where the severity appeared equal. The headaches were associated with the following conditions: hypertension, 12 cases; diabetes, 2 cases; spinal puncture, 4 cases; dental extraction, 5 cases; syphilis, 2 cases; cardiac rheumatism, 2 cases; cerebral hemorrhage, tertian malaria, carcinoma and dysmenorrhea, each one case. Arthritic pains were investigated in 8 cases, neuritis of the limbs in two cases, and thoracic pains of cardiac rheumatism in one case.

These analgesic investigations were not begun under any illusions as to the difficulty with which subjective evidence of pain can be evaluated. The degree of pain was most carefully inquired into at each test. It was practically identical in the same patient in each one of the two or more reported observations. When one drug had been tested an a practically identical degree of pain could not be obtained on a near subsequent day the case was dropped from further consideration. Other work had to be discarded owing to doubts arising as to the subject's intelligence or suitability in other ways. Furthermore, no instances of incomplete relief have been included in our comparisons.

Based on oral administrations to thirty-nine very conservatively selected patients, a total of fifty-four comparisons between amidopyrine and the mixture with magnesium oxid were made. Two criteria of analgesia were employed throughout; these were (a) the time required to secure complete relief, and (b) the duration of the total relief.

Averages of the figures from different patients with different sorts of pains would have little value. We base all our comparison upon the results of giving each drug to the same individual. The patient's word had to be taken as to the degree of pain felt in each case. Questions of tolerance or emulation may be reasonably ruled out where either of these two drugs are used, in the doses given, at least 24 hours apart. A further safeguard however, was introduced by reversing the order of administration in many cases.

While thirty-nine cases are too few to afford definite conclusions, it is felt that they were selected and followed with sufficient critique to be of considerable evidential value. Regarding it as generally accepted

that equal weights of MgO will by no means exhibit as great analgesic efficiency as amidopyrine, one can say that if the mixture exhibits an action equal to or better than that of amidopyrine, true "potentiation" is shown. The results point decidedly in this direction. They are summarized in the table. Frequently the same observation was repeated on the same patient; here the average result was used in compiling the summary. Since the patients were essentially consistent among themselves but differed from one another, it is proper to summarize the results by cases rather than by comparisons, of which there were fifty-four altogether. One of the 39 individuals is included three times in the summary because at considerable intervals he was treated for pains having respectively three separate origins.

Using the criterion of quicker relief, amidopyrine without MgO was found superior in only 22% of all cases; where the criterion was duration of analgesia, amidopyrine was found superior in only 17% of all cases. Thus, potentiation of amidopyrine by magnesium is indicated in about fourfifths of the patients tested.

No patient was included in the series unless at least one of the two drugs gave complete relief. Of the cases reported, two failed of relief from sharp headache by amidopyrine, but the temporary relief by the mixture was complete. One of the patients presenting the severest cases of pain was only partially relieved from spinal arthritic pains by 15 grains amidopyrine, getting however complete relief temporarily by 15 grains amidopyrine plus magnesium oxid. On the other hand, the 15 grain group includes also one patient who got no relief from the mixture on one occasion, although completely cured of his headache at another time by the same mixture, and twice by amidopyrine alone. This is the only instance observed where the mixture failed completely unless amidopyrine was equally useless, and the case for that reason discarded.

The findings in two further cases may be of some interest. Here a mixture of 5 grains each of amidopyrine and magnesium oxid was compared with a mixture of aspirin, 10 grains and codein sulfate,  $\frac{1}{2}$  grain. In both cases the two methods of treatment were about equally rapid in effect and long in their relief. Amidopyrine, ten grains, was found practically equivalent to this aspirin-codein mixture not only in the two cases just cited but also in another in which no magnesium oxid was used.

#### SUMMARY

Amidopyrine was compared with equal weights of a mixture of equal parts amidopyrine and magnesium oxid for relief of

pain. Fifty-four pairs of comparisons were made in thirty-nine intelligent, adult hospital patients, complaining of headache, arthritic, neuritic or other pain. Most of these were treated with ten grain doses of each drug, a smaller number with either five or fifteen grains of each.

Relief was quicker with amidopyrine plus magnesium oxid (equal parts) in 60% of cases; with amidopyrine in 22% of all cases;

and was equally rapid with the two drugs in 18% of all cases.

Relief lasted longer with the combination in 51% of cases; with amidopyrine alone in 17% of all cases; and lasted equally long with the two drugs in 32% of cases.

Since magnesium oxid is a weaker analgesic drug than amidopyrine it appear to have "potentiated" amidopyrine in about four-fifths of the patients tested.

TABLE  
SUMMARY

Dose of Amidopyrine or of Mixture	5 Grains		10 Grains		15 Grains		All Doses	
	No. cases	%	No. cases	%	No. cases	%	No. cases	%
Relief quicker with Amidopyrine	1	9	6	25	2	40	9	22
Relief quicker with Amidopyrine MgO	7	64	14	58	3	60	24	60
Relief equally quick with or without MgO	3	27	4	17	0	0	7	18
Total	11		24		5		40	
Relief lasted longer with Amidopyrine	2	18	4	16	1	20	7	17
Relief lasted longer with Amidopyrine MgO	6	55	12	48	3	60	21	51
Relief lasted equally long with or without MgO	3	27	9	36	1	20	13	32
Total	11		25		5		41	

## LEAD POISONING, REPORT OF A CASE\*.

JAS. W. BRUCE, M. D.

Louisville.

I wish to report a case rather unusual in my experience.

Patient, male, white, age twenty months, was brought into St. Joseph's Infirmary at night. Previous medical history unimportant. Two weeks before admission to the hospital his mother had noticed that he was not eating well and seemed to lack "pep". He did not seem to be sick but just a little out of sorts. Suddenly, at ten o'clock on the morning of admission to the hospital, the child went into convulsions, which continued all day, being mostly on the left side, although occasionally on the right side, involving the legs, arms and face. The convulsions continued uninterruptedly for twelve hours. They were very severe and all the usual remedies were applied, including magnesium sulphate, fifty per cent glucose intravenously, spinal puncture and chloroform, and it was only when the child was in a state of narcosis that he was free of convulsions. The following day the convulsions had ceased, with the exception of one or two, not severe. On the third day he was able to sit up. He stayed at the hospital 9 days altogether and continued to be weak on the left side, but had some use of it.

Blood count on admission showed 4,460,000 red cells; 72% hemoglobin; 22,800 white cells; polymorphonuclears 81%, and there were large numbers of stipple cells in each high-powered field. The spinal fluid, obtained after admission to the hospital, was clear; no increase in pressure. The cell count

was nine and there was an increase in the globulin content. Fibrin filament test, made the next day, showed a slight filament. On testing the spinal fluid for lead, a positive reaction was obtained.

The urine on admission to the hospital was quite acid; specific gravity 1030; acetone negative. Lead test positive.

The red cells showed a normal fragility test, beginning hemolysis at 1.4 and completing it at 3.

We did not know what was the matter with the child until we found the stipple cells and after that we began pushing calcium as hard as we could. This helps to get the lead absorbed into the long bones. We made some pictures and the characteristic deposit of lead was noted in the epiphyses.

After the patient had been in the hospital a week, blood count showed 2,760,000 red cells; 52% hemoglobin; white cells 10,000, with normal differentiation and very few stipple cells.

That is about all there is to the clinical history of the case. These x-ray pictures are very interesting, showing very marked lead lines in the epiphyses of all the long bones, particularly the lower ends of the radius and ulna.

One peculiar thing noted by the author of a recent article on this subject, is that the lead lines show in the second, third, fourth and fifth metacarpal bones but not in the first.

The subsequent history of this case will probably be interesting. The forced administration of calcium was accomplished by giving the child large quantities of milk and calcium chloride by the mouth and also by intravenous and intramuscular injections. In endeavoring to trace the source of the lead, I asked the child's mother if he habitually

\*Read before the Louisville Medico-Chirurgical Society.



chewed on his crib, which is the usual source, but this the mother denied. I then obtained a sample of the drinking water and it showed a positive test for lead. However, no one else in the family has shown any symptoms of lead poisoning, and they have been living in their present quarters for four months. The only possible explanation I could find of the contamination of the water was that a plumber, in putting in new pipes, had used white lead in caulking the joints.

As to the prognosis in this case, the child evidently has rather tremendous deposits of lead, and any one of several things may happen. The lead may stay in the bones for a time and then, upon a sudden shift to an alkaline or an acid state of the blood, may again get into the general circulation and produce convulsions. That is apt to be the history in these cases.

#### DISCUSSION

**Harry Frazier:** Dr Bruce's case is very interesting. As to treatment, I suggested one that was widely talked of a few years ago and which I have tried in one case; that is, the use of calcium to stabilize the lead and concentrate it in the bones, then following it by the administration of parathormone to demobilize it. I saw this tried in a case of chronic lead-poisoning in an adult patient which had persisted for some time. The calcium chloride was given intravenously to stabilize and concentrate the lead and about a week later several doses of parathormone were given, which was in turn supposed to promote decalcification and release the lead along with it. I do not know what the general results of this treatment have been.

**J. Murray Kinsman:** I would like to ask Dr. Bruce if the diagnosis in a case of this kind could be made from the x-ray pictures alone?

**J. W. Bruce:** I do not think so.

**W. J. Young:** As a matter of information in regard to the therapy, would not the use of ultra-violet rays be of assistance in getting the calcium into the system?

**J. W. Bruce, (in closing):** Regarding the treatment suggested by Dr. Frazier, I have never used parathormone, nor have I ever heard of its being used.

As to what effect the ultra-violet rays would have in stabilizing the lead or causing it to become mobilized, I am unable to say. We do not know just why it is that calcium tends to stabilize the lead; there is no chemical combination between the two; they are quite independent of each other. However, we know that if we can get enough calcium into the system, it seems to get the lead stabilized and concentrated in the bones.

There are several methods of getting the lead out of the system, such as giving alkalis, or acids, or potassium iodide, any one of which

will tend to de-lead the patient, but we must use them very carefully or we may get the lead back into the circulation too rapidly with a consequent recurrence of the symptoms.

#### BLINDNESS FOLLOWING MEASLES, CONTINUED REPORT OF CASE\*

S. G. DABNEY, M. D.

Louisville.

I wish to make a continued report of a case presented to this society in June and as some of the members here tonight were not present then, perhaps a brief resume of the history is in order.

Patient, a child, female, eight years of age, in a family of average intelligence. Two other children in the family contracted measles which the family physician diagnosed, but as they got along so well without any untoward symptoms, he did not return to see them. During the first week in May, 1931, this child contracted measles and the parents were so positive of the diagnosis that they did not call the doctor in, simply telephoning him. On May 10 the child complained of her eyes, saying things looked blurred and the next morning was totally blind. The doctor was called but was unable to diagnose the cause of this condition. He made a urinalysis, I believe, which was normal. I do not know whether he made any further urological examination or not. I realize that there is room for criticism because of the fact that no more thorough examination of the child was made at that time, but you must bear in mind that this family lives sixty miles from Louisville and that facilities for extensive laboratory investigation were not available.

There was no change in the child's condition by June 10th when she was brought here. When she was brought into my waiting room I could tell from the way she walked and handled herself that she was totally blind. Upon examining her eyes I found the pupils widely dilated and there was not the least contraction to brilliant light; in fact, with the flash light thrown directly into the eyes, she did not wink or show the least evidence of any perception of it. There was no history of headache, stiffness of the neck, double sight, vomiting or convulsions. She had had the fever which ordinarily attends measles and which disappeared in the usual time. While it was rather difficult to get a satisfactory view of the eye in a child eight years old, with the eyes constantly rolling, the fundus appeared to be perfectly normal.

I did not make a diagnosis then and am

\*Read before the Louisville Medico-Chirurgical Society.

not prepared to make one now. What is more important is the prognosis. According to Foster Moore, the author of a recent work on ophthalmology more than half of such cases recover their sight although they may be blind for a period of from four to eight months. Therefore, I told the parents that this child would probably get well or, at least, a great deal better. Being unusually interested in the case I kept in touch with the family physician, and some time after that he advised me that the child was showing some improvement. Today he brought her to see me again and I found her decidedly improved. In the meantime, she had been given considerable iodide of iron, as she was rather anaemic. She had been to another physician who does eye-work and perhaps forty-eight hours previous to the time I saw her had been given some drops to dilate the pupil, and perhaps the pupillary reaction when I saw her was somewhat interfered with by these drops. At any rate, the extreme dilatation of the pupils noted on my first examination had disappeared, and the fundus appeared to be perfectly normal. The child not only can perceive people in a room but can also read large size test figures. Return of sight was first noted early in September, the child having been totally blind from May until that time. No spinal fluid examination has been made, the reflexes have not been tested, and perhaps other things that would aid in a diagnosis have not been done.

Foster Moore, in his description of this condition, attributes it to meningitis and says that sometimes the eye-symptoms constitute the only feature of such a case.

When I first reported the case, Dr. Frank suggested the possibility of hysteria. I rejected that theory principally because the pupils absolutely failed to respond to light, whereas in an overwhelming majority of cases of hysteria, the pupils will contract to light. I believe Foster Moore and Fuchs are right when they say that when the pupils fail to contract to light, some organic disease is responsible for the condition. Furthermore, hysterical amaurosis, with total blindness in both eyes, without marked symptoms otherwise would be very extraordinary.

#### DISCUSSION

**Louis Frank:** What does Moore say as to the pathology of these cases?

**S. G. Dabney:** He has incorporated his description of this condition in a chapter on cerebrospinal meningitis, which is a little confusing as he fails to separate them clearly. However, he says that blindness may occur and continue for some time without evidence of optic nerve disease. It seems to me that it would be hard to diagnose a meningitis of that

kind without some clinical symptoms. Moore calls the condition "acute cerebral amaurosis of infancy."

**W. E. Gardner:** It would be rather hard to figure out the mechanics of Dr. Dabney's case from the standpoint of a meningitis unless there was some pressure in the optic tract. I want to congratulate Dr. Dabney however, upon his prognosis and the fact that it is turning out to be correct. I judge from his report that there was nothing about the general condition of the patient to indicate any other neurological condition—no paralysis, no headache, eye-grounds normal, etc. One would think, of course, of a toxic neuritis, but in such event there would be some changes in the disc. When he reported this case before I was unable to give any satisfactory clew regarding the etiology and cannot do so now.

**John J. Moren:** In Volume 43 of the Johns Hopkins Medical Bulletin, there is an article by Ford on the subject of cerebral symptoms following measles which may throw some light on this case. Dr. Dabney's examination of his patient showed that there is no optic nerve disease; therefore, the lesion must be in the cerebral center. In view of the fact that encephalitis frequently follows measles, may it not be reasonable to assume, in Dr. Dabney's case, that there is a localized process in the occipital lobe, possibly an oedema? Other than that, I have no explanation to offer. I cannot believe that it is a meningeal condition in the absence of other symptoms. I would say that it is cerebral rather than meningitic.

**S. G. Dabney, (in closing):** I have never seen a case of bitemporal hemianopsia, but according to the literature on such cases the blindness goes right up to but does not include the spot of direct sight. The blindness is not complete, as there is central sight.

#### Medical Treatment of Echinococcus Cysts—

Lolli concludes from his researches on rabbits that neorsphenamine does not influence in the least the course of echinococcus disease in man. In fact, it does not change the vitality of echinococcal elements that, on inoculation into the rabbit, give rise to new cyst formations. Furthermore, arsphenamine therapy, applied to the rabbit simultaneously with the inoculation of echinococcus material, does not succeed in preventing the evolution of the parasitic disease. This proves that neorsphenamine is inactive not only in cyst formations but also in the newest elements that are particularly delicate. Hence no value can be assigned to the drug even for the prophylaxis of secondary echinococcosis. Since it is now so easy to produce echinococcus disease in the rabbit, it is reasonable to expect that no drug will be applied to man until its efficacy has been shown by animal experimentation.



CARCINOMA OF THE CERVIX. IMPEDING LABOR. REPORT OF CASE\*

J. GARLAND SHERRILL, M. D.

Louisville.

Sometime ago I was called to see a patient who had been brought into the hospital in labor which had progressed some sixteen or eighteen hours without the head having engaged. The woman, 35 years of age, had been delivered of two children previously. The physician in charge had already made a diagnosis of carcinoma of the cervix impeding the progress of the labor. The membranes had ruptured and he was of opinion that it would be best to do a Cesarean operation. Upon examination I agreed with his findings and proceeded to do a Cesarean operation, removing the child. I found the membranes very closely attached to the uterine mucosa and it required more time than I have ever before found necessary to make separation. The uterus was removed by the supra-vaginal method, because of the danger of hemorrhage and the fact that it offered a better chance of controlling it; also because it afforded better control of the cervical tissue and enabled dissection without damage to the bladder, ureters or rectum. It was comparatively easy, after removal of the uterus, to hook my finger under the cervix and make the dissection, the cervix being removed in the form of a collar about three inches long. The wound was closed without drainage and the patient put to bed. The amount of shock was slight and on the ninth day the patient was sent home with the wound entirely healed and apparently in a fair way to recover.

One question that arises in a case of this kind is whether or not radium should be used. I did not advise it in this case. There is always the danger of damage to the surrounding tissues, or even the developing of a fistula, and I believed that better results in this case would be obtained from the use of deep x-ray therapy. I do not mean to say that radium should never be used in cancer of the cervix, because in some cases the result are excellent. The early cases are the ones that give us the most trouble, women from 28 to 34 years of age—because in such patients the cancerous growth tends to spread much more rapidly. If there is any case in which the tendency to spread could be expected to be pronounced it would be in this one and I intend to watch her closely and make a report of the final outcome of the case.

DISCUSSION

**Louis Frank:** I do not recall having seen more than two cases of cancer of the cervix complicated by pregnancy, or vice versa, as you choose. In the presence of definite carcinomatous changes in the cervix of the uterus, pregnancy is not very apt to occur and, furthermore, carcinomata of the uterus usually develop at the period of life when the woman has reached or passed the menopause.

I do not believe the case could have been better handled than in the manner Dr. Sherrill described. I do not know what the opinion of obstetricians would be as to the method of procedure, namely first doing an abdominal Cesarean operation followed by removal of the uterus. There is no question in my mind that the uterus should be removed, but whether to do it at the time or later is a question which my personal experience does not justify me in answering. I do believe, however, that no radical operation for carcinoma of the cervix is complete unless a real Wertheim operation is done, with removal of all the glands in the pelvis and about the iliac vessels, without which permanent results cannot be hoped for.

This is hardly a case which justifies discussion of the use of radium in contradistinction to radical operation for cancer of the cervix. We know, however, that the latter carries with it a definite primary operative mortality that is hardly under ten per cent under the most favorable conditions and in cases not complicated by pregnancy and that this does not obtain in cases treated by radium. I think Dr. Sherrill is right in not advising radium treatment following the type of operation used in this case, because it would be impossible to screen the thin vaginal wall sufficiently to obviate the danger of fistula, not only from the bladder but from the bowel, and I agree with him that high voltage or deep x-ray therapy is the preferable plan of procedure in such a case. I will be interested in hearing a further report of the results obtained.

**J. G. Sherrill, (in closing):** I am sorry I did not bring the pathological report made by Dr. Miller in this case. However, I believe his diagnosis was adeno-carcinoma of the cervix.

I do not recall having seen in my own work any other case in which delivery was delayed or prevented by carcinoma of the cervix. It is quite possible that this carcinoma developed after the pregnancy began.

The tissue removed was taken out en bloc and I am hopeful that it was all removed but, of course, we have no means of knowing whether any of the carcinomatous cells were left behind. If so, the prognosis is grave.

Cases of this kind help us in our study of carcinomata and I will take pleasure in making further reports on this one from time to time.

\*Read before the Louisville Medico-Chirurgical Society.

PAGET'S DISEASE OF THE BREAST,  
REPORT OF TWO CASES\*

WILLACE FRANK, M. D.

Louisville.

In the following cases which form the basis of this report, I think the treatment of one was correct, and the treatment of the other incorrect. I do not mean to criticize anybody, but the result obtained in the case that was treated incorrectly is so evident that it needs no comment. I might say that I made the same mistake some 8 years ago with even worse results; consequently, when I saw the first case, I knew what to do, and when I saw the second one, of course, I recognized the error that the other man had made and knew that he had not treated a similar case previously.

Case 1. E. S., aged 67, came to me with the following history:

She had been operated upon on two previous occasions, once for thyroid disease and the other time for some pelvic condition.

The present illness dated back about five years, at which time she had a good deal of irritation of the left nipple followed by a moderate amount of sticky discharge. She had been treated by four or five physicians, one of them a former member of this Society, for eczema of the nipple with no results. She went on to say that there had never been any bleeding from the nipple. There were no lumps in the breast, and except for this irritated nipple, she thought she was perfectly well.

Examination showed the scars of the two operations. The heart was in fair condition. The right breast was normal with the nipple soft. The left breast showed a firm, moist, strawberry red nipple with a small amount of sticky discharge. No masses could be felt in the breast. No glands were palpable in the axilla.

A diagnosis of Paget's disease was made, and she was advised to have the breast removed. She told me, however, that she had come to me for radium and did not want another operation. I told her that she might have come to me for radium, but I would not give her radium for such a condition. I tried to make it plain that the condition was a surgical one, and the breast should be removed. About 10 days later, I operated, doing a simple amputation of the breast. The pathologist reported no change in the epidermis covering of the nipple so far as malignancy was concerned, but in the ducts extending downward along the duct system for about 1½ inches into the breast was carcinoma.

Case 2. Mrs. K. T., aged 76, referred to me by Dr. Frank Stites with a history of Paget's disease of the left nipple. This patient had been treated for the disease by the application of radium to the nipple, and now complained of a lump in the breast.

Examination showed the left breast containing a mass deep in the mammary tissue. The nipple was absent. There was fixation of the skin, and enlargement of the glands in the left axilla. A diagnosis of mammary carcinoma was made, and a radical operation performed. The pathologist, Dr. A. J. Miller, stated that the diagnosis was scirrhus carcinoma of the breast and chronic lymph-noditis.

I am convinced that the second case should not have been treated with radium in the first place.

Some 6 or 7 years ago, I treated a case of Paget's disease with radium. The patient later developed a breast carcinoma with spinal metastasis and died.

Strange, to say, in the study of Paget's disease, there has been practically nothing added to the clinical description or clinical knowledge of the disease since the time that Sir William Paget wrote his paper in 1874, except the fact that the disease is practically always unilateral. There are cases on record that have gone six, seven, eight and as long as twelve years without evidence of carcinoma in the breast, but sooner or later it always appears.

In the first case, there was absolutely nothing that you could feel, yet, the pathologist reported infiltration with carcinoma 1½ inches below the nipple.

I thought these two cases of sufficient interest to bring before the Society, because with treatment in one, the patient undoubtedly has an exceedingly good chance to get well, whereas with treatment in the other, it is a big question as to whether or not a cure will be obtained.

## DISCUSSION

**Sidney Johnson:** I quite agree with Dr. Frank as to the results of radiation treatment in most cases of breast tumor. Such treatment is often palliative, but in some cases may actually do harm. The course of the disease is not often altered to an appreciable degree. Certain types of tumors respond rather well to x-rays or radium. In my opinion, however, Paget's disease and melanotic tumors should never be irradiated.

**W. J. Young:** This is a very interesting subject to me. I agree entirely with what Dr. Wallace Frank has said in regard to Paget's disease. I think the best proof we have is the fact that when these cases are operated upon, we find a malignancy of 1½ inches below the surface. We do have eczema of the breast, how-

\*Read before the Louisville Medico-Chirurgical Society.



ever, on which it would be rather silly to do a breast amputation. I think such cases usually can be diagnosed. Inasmuch as we treat those cases of eczema of the breast with a fractional or what we call one-quarter Holzknecht unit of x-ray at weekly intervals, the eczema can be handled very nicely. When it comes to eczema of the nipple, to my mind we get a change in that nipple just as we do in papillomas which we have on the face. White papillomas become hard and changes take place. Certainly, irradiation from either x-ray or radium I think inadvisable. I will have to admit that I have done it at times. In defense of the radiologist, I take part of the blame, but on the other hand sometimes we are almost forced to do it by the surgeon himself. The patient refuses to be operated upon, and the surgeon very often brings you the case to see what you can do. I am awfully glad that Dr. Wallace Frank has brought this to our attention, because it is a thing that should not be done.

So far as co-operation is concerned between the surgeon and the radiologist, I have harped on that all of my life. I do not know that the radiologist is any more to blame than the surgeon. Sometimes being on the radiotherapist's side, I think the surgeon is a little prone to be promiscuous with this one therapeutic agent. This is a very timely case report, and I think we all agree to the fact that we should not irradiate Paget's disease.

**Garland Sherrill:** Paget's disease of the nipple has been studied for a number of years, and, as Dr. Frank has said, very little has been added to our knowledge since the time of Paget's classical paper.

The first question that arises in a case of this kind is the possibility of a mistake in diagnosis of Paget's disease, when the condition might simply be eczema of the nipple. In an irritative disorder, particularly one which has a discharge at the nipple, then you had better consider the question of malignancy very carefully. Paget's disease is not only a superficial affair of the surface of the nipple, but the trouble extends down into the ducts, as mentioned by Dr. Frank. Having this in mind and also the fact that Paget's disease may exist for a number of years before its malignancy is recognized, one should be very careful before recommending any form of treatment which would produce irritation of the nipple. The history of this disease is that it progresses for a number of years slowly but constantly, giving irritation, and finally develops into a typical malignant disease. The probability is that the malignancy is there in the early stages; it invades the ducts, and through irritation from the nipple and the cells along the ducts, the disease is established. Of course, we should differentiate Paget's disease from a simple galactocoele of the milk bearing ducts.

Another interesting point which Dr. Frank mentions, and one which I find very frequently, is that in the early stages of carcinoma, lymph nodes removed are frequently the site of inflammatory changes, not yet malignant, and in the condition is allowed to continue, later a typical picture of malignant change occurs in the regional glands. It is well known what a grave condition develops in a malignant disease of the breast when irritated or when left too long without surgical intervention. After all, if we do not remove enough skin in the immediate neighborhood or in and around the breast, particularly in Paget's disease, we are likely to have a recurrence locally in the skin, and once recurring, one never can tell how far these cells are going to be transplanted into the neighboring tissues and into the ducts. The occurrence of bone cancer following breast cancer is more frequent now than in former times.

The question arises: Are we doing the proper thing when we fire at these beginning malignant breasts with an electrical discharge or with radium, perhaps breaking loose some of the cells which are already in the lymphatic channels?

Paget's disease, if left alone, continues for a number of years before it breaks down and makes an actively growing cancer, and should be treated by radical surgical removal.

**Louis Frank:** I want to speak only of the first case that Dr. Wallace Frank mentioned.

This individual came under our observation I think probably 10 or 11 years ago. It was early in our use of radium. She had had a previous abdominal operation and objected very much not only to an operation but to the mutilation which would follow. She was a large handsome woman. At that time, I thought radium probably might cause a cessation of the disease. We treated her a number of times, as she was under our observation for a period of about two years. Before the end of this period however, when it became very evident that radium treatment was absolutely useless, she was advised to have a radical operation. This, however, she postponed for quite a while on account of the mutilation to which she objected very strenuously. I think Dr. Abell operated upon her later, at which time she had bone metastasis, dying very shortly afterwards.

This was the first of Paget's disease case that we saw after we had radium and the only case that we have treated with radium. We have seen a number of cases since and also before which were all treated by radical operation.

I remember the late Dr. Bloom, expressing himself in discussion at the Surgical Society, was opposed very strenuously to operating upon these individuals, doubting that the disease was truly cancerous, and believing that benefit could be secured by local treatment.

These cases are not to be treated with radium under any circumstances. I shall repeat a state-

ment which I have often made, that I think it is wise in most conditions that are not purely local lesions about the lip, about the tongue and about the uterus, etc., to have the individual gone over by a general surgeon, certainly from a diagnostic standpoint, as to the extension of the disease and as to the advisability of the plan of treatment before radium appliances are made. If only one remedy is at hand, one is so prone to use that remedy in preference to some other. I believe I may truly say without prejudice and without casting reflexions, that probably our radiologists today are a little bit too prone to advocate the use of radium or x-ray to the exclusion of surgical methods. I believe that often many men have advocated favorably the use of radium when, as a matter of fact, a surgical operation should have been carried out. This is one place where the radiologist and the surgeon should co-operate very closely. The surgeon who does not know anything about radiology has missed a great deal. I think that he will not get the same results as the surgeon who has had experience with radium and x-ray therapy. I believe, also, that the benefits of surgery and the advice of the surgeon should not be lost sight of by the radiologist. From my reading of the literature, I believe there is a tendency today a little bit too far toward the side of radiology to the neglect of surgical methods of intervention.

**Wallace Frank**, (in closing): I appreciate the discussion, and I think emphasis should be placed on what the last speaker has said—that eczema of the nipple does occur and is responsive to radium or x-ray therapy, but it should respond in a relatively short time. If it does not respond, you may be assured that the condition is not eczema.

One of my patients had been treated by three or four physicians who were well versed in the treatment of skin lesions, and yet she never improved. The cause of her condition should have been suspected, and the proper treatment instituted long before 5 years had elapsed.

Another thing I would like to mention is the pathology of the disease. This is an extremely interesting subject, and there are two absolutely divergent views as to the cause of it. According to Handley, the carcinoma of Paget's disease begins in the duct system, invades the lymphatics about the areola and nipple, and as a result of the block, you get desquamation of the epithelium, just as you would in a leg subject to elephantiasis or of chronic edema due to varicose veins, thus producing the raw weeping nipple. The other theory of which Fitz William and a good many other men are advocates is that the disease begins as carcinoma in the nipple itself and spreads to the ducts.

Another interesting feature of this disease is the fact that the cancer which develops following Paget's disease is never adenocarcinoma.

It is always scirrhus carcinoma and arises from cuboidal epithelium of the ducts.

## SURGERY OF THE COMMON DUCT\*

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Louisville.

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In this short paper I will not enter into a discussion of the various symptoms, x-ray and laboratory tests commonly employed in diagnosing disease of the biliary tract, as this phase of the subject is so well known by all physicians. I will deal only with the technical phase of this subject with which there is less familiarity. Common duct obstruction is one of the most serious of surgical conditions. I have observed obstruction due to stones, angulation from adhesions, stricture from external adhesions, obstruction due to pressure made by an abscess at the site of a previous cholecystectomy and obstruction produced by neoplastic disease of the head of the pancreas; as well as trauma to the common duct as a result of previous operations.

Surgery of the common bile duct cannot be discussed without at least mentioning the liver, hepatic ducts, gall bladder, cystic duct, pyloric and of the stomach, duodenum and the pancreas. For, pathological conditions in all of these various anatomical structures can, and do, exert their influence on the common duct. Of the various structures mentioned above, the liver and gall bladder have the most direct bearing on the common duct.

It is a well recognized physiological fact that the liver performs the very important function of detoxifying the body—neutralizing both bacterial and chemical toxins. This physiological function of the liver, namely, destroying bacteria and toxins brought to it by the portal circulatory system, probably is one of the chief factors in producing cholangitis, cholecystitis and inflammatory changes in the common bile duct, as well as those ascending infections which may find their way into the common duct from the intestines.

Let us briefly review the anatomy and surgical histopathology of the common bile duct. The duct begins at the mouth of the portal fissure where it is formed by the union of the hepatic and cystic ducts. From here it passes downwards in front of the foramen of Winslow lying between the layers of the lesser omentum. It is accompanied by the hepatic artery to the left and the portal vein behind the duct. The common duct then descends behind the first portion of the duodenum and then between the

\*Read before the Jefferson County Medical Society.



descending portion of the duodenum and the head of the pancreas, where, as a rule, it meets the pancreatic duct. Then the two obliquely enter the descending duodenum forming the ampulla of Vater three to four inches from the pylorus. The ampulla of Vater contains the sphincter of Oddi which plays a very important part in common duct disease. It is through the influence of the sphincter of Oddi that the common bile duct is drained and the gall bladder is filled. The length of the common duct on an average is three inches; its diameter variable from one-fourth inch up to the size of the small intestines under certain circumstances.

Burden has probably given the best surgical and histo-pathological study of the common duct.

Upon laying open a common duct the mucous membrane appears to be reticulated but under the microscope the mucous membrane is pitted and many of these shallow depressions contain mucous plugs. Cross sections of the common duct show it to be lined with tall columnar epithelium. Beneath the epithelium is a layer of thick connective tissue containing considerable elastic tissue. The muscular layer of the duct is composed of loose areolar tissue, oval bundles of unstriped muscle fibers arranged both longitudinally and circularly. The lymphatic and blood vessels of the duct are found in the muscular wall. There are numerous mucous glands in the mucous membrane and these glands are where we find the inflammatory changes in the duct which produce marked thickening of the duct wall, and, in some instances, are the underlying factor in ulceration or stricture of the common duct. Other pathological conditions found in the duct are stone, perforative ulceration, distension with muddy and sandy bile, neoplastic growths, diverticulum, cysts of the duct, angulation of duct from external adhesions, pressure from external abscesses and neoplasms. Traumatic conditions found in the duct are usually the result of gall bladder surgery and include section and removal of a portion of the duct wall, tearing and ligation of the duct. These accidents may occur in the hands of the best surgeons but if unrecognized, result in permanent jaundice followed by liver destruction or biliary fistulae and a surgical derelict, unless the unfortunate individual comes into the hands of one capable of dealing with this very difficult surgical situation.

The common duct is brought up in order that it may be approached surgically by placing the index finger and second finger in the foramen of Winslow and compressing gastrohepatic omentum between the thumb and fingers. The normal duct is difficult

to palpate but if inflamed and thickened, or contains a stone, it is more easily palpated. However, the fact that no stone is palpated does not preclude the fact that no stone exists, for sometimes even with the duct open it is very difficult to locate a stone. When the foramen of Winslow is occluded by adhesions the gastrohepatic omentum must be split at its lower right border to locate the duct. The normal duct is a blue color about the same color as a normal gall bladder.

Even with the above information it becomes necessary at times to aspirate the common duct with a very fine needle to differentiate it from the vein.

Once the common duct is located I usually grasp the duct gently with two forceps and very gently free the duct of adhesions. I have found angulated dura scissors to be the best instrument in my hands for opening the duct. The duct being opened it is gently evacuated of bile, bile sand or stones. It is certainly not advisable to attempt to crush a stone while it is in the common duct as there is always a possibility of injury to the duct.

If neoplastic disease, either primary or secondary, of the common duct is encountered, or a large cyst or diverticulum, it is probably best not to attempt an anastomosis of the duct itself but rather to anastomose the gall bladder to the stomach or duodenum. However, if this is impractical, the resection of the duct may be attempted if the neoplasm is benign. Then, if the resection is a failure and a biliary fistulae forms, this fistulae, once it is well established, may be later transplanted. When obstruction of the common duct is due to pancreatic disease or neoplasm of the head of the pancreas it is probably better to anastomose the gall bladder to the stomach or duodenum. This would also apply to malignancy of the ampulla of Vater when producing obstruction. Occasionally, intermittent obstruction of the duct may be due to spasm of the sphincter of Oddi. If condition is suspected, excision of a portion of the sphincter of Oddi should be done.

The primal motive of all common duct surgery is to restore the flow of bile into the intestinal tract. No common duct should be closed until the operator is satisfied by inspection, palpation and the passage of probes through the ampulla of Vater to prove that the duct is open and free of all obstruction.

For the usual pathological conditions the duct is drained by a T-tube. I prefer to cut the limbs of this tube fairly short and suture the tube in place with interrupted sutures of linen. Also to suture the gastrohepatic omentum well around the T-tube as it

emerges from the common duct. I also use cigarette drains in closing the abdomen. The T-tube may be left in the common duct as long as the pathological condition requires or the surgeon desires.

In obstruction of the common duct produced by operative trauma, the duct, in my opinion, is exposed to the trauma by excessive traction on the gall bladder, as the cystic duct is ligated, and also by anatomical anomalies of the cystic and common ducts. I sometimes think there would be fewer cases of common duct trauma if the gall bladder were removed from above downwards. When the common duct is ligated or wounded, we are faced with the necessity of re-establishing the duct. This may be done in various ways. If the gall bladder remains in situ it can be anastomosed to the stomach, duodenum or small intestines as a relatively simple technical procedure. If, however, the gall bladder is not available, an end-to-end suture of the duct can be done over a T-tube. It has been proven by various surgeons that it is not good surgery to anastomose the common duct over rubber tubing and leave the tube in position. The rubber tube is well tolerated by the duct but eventually the lumen of the rubber tube becomes plugged by a deposit of bile salts producing obstruction and making it necessary for the tube to be removed. End-to-end anastomosis of the common duct is probably the most desirable of all methods of common duct reconstruction and has given a high percentage of good results in those cases where it could be employed.

Then, in some instances, the severed duct has been implanted into the duodenum on its anterior surface, the duodenum having been previously mobilized by an incision along the outer border.

Should operative procedures on the common duct result in failure, we still have at our disposal the possibilities of transplanting the resulting external biliary fistulae. Czerny, a German surgeon, was the first to transplant an external biliary fistulae. He performed this operation in 1898 but did not report the operation. Jordan did a similar operation in 1899 and reported the case. Merk reported a case in 1902. The first case of transplantation of external biliary fistulae reported in America was in 1918 and was done by Dr. F. T. Murphy. Collins reported a case in 1919, Lahey two cases in 1923, Whipple two cases in 1927 and Williams a case in 1929. Walters, of the Mayo Clinic has recently reported five cases with good results in four of them. Lahey, of Boston, has recently reported ten cases with satisfactory results in six cases.

Before transplantation, the biliary fistulae

must be well established and there must be no question of the fistulae having a good blood supply. Otherwise, the fistulae will undergo necrosis. The fistulae should be dissected from the abdominal wall leaving a wide margin of tissue. The dissection is carried down to the liver, being cautious not to dissect the fistulae from the liver as this may also interfere with its blood supply. The fistulae is next cut off, leaving a portion extending beyond the border of the liver. The stomach, duodenum, or small intestines is then brought into approximation with fistulae and the viscera punctured. The protruding fistulae is inserted into puncture and the wound is closed by suturing the viscera to the under surface of the liver. The suture line is further reinforced by suturing the gastrohepatic omentum around the site of operation and then omentum is then turned up to cover the entire operative field. The transplantation of external biliary fistulae is a practical, ingenious method of restoring the flow of bile into the intestinal tract and is fairly simple from a technical standpoint.

#### CONCLUSIONS

Those surgeons doing surgery of the biliary tract should familiarize themselves with the anatomical anomalies of this tract.

In the removal of the gall bladder from below upwards, excessive traction should not be used as this angulates the common duct making it more susceptible to injury.

Rubber tubing should at no time be left permanently in a common duct. If common duct reconstruction is to be attempted over a tube the T-tube should be used and removed after it has served its purpose.

End-to-end suture of the common duct is the most satisfactory method of duct reconstruction where it can be employed.

Where common duct disease or trauma has resulted in an external biliary fistulae the transplantation of this fistulae with due attention to its blood supply will give a good functional result in the majority of instances.

Gall bladder disease should not be neglected as the gall bladder directly or indirectly is responsible for most of the common duct complications and surgery.

#### DISCUSSION

**John R. Wathen:** Dr. Strickler has entertained us with a very complete paper on this subject. It is a very difficult subject from a surgical standpoint.

Surgery of the gall-bladder is comparatively recent. There were very few gall-bladder operations done thirty years ago. In those times, it was simply to operate and cut into the gall-bladder, and remove the gall-stones. There has been a great deal of progress made since then. Today, we do not see so many cases that are



simple cases, we see difficult cases. Now, for example, since introducing cholecystectomy, the operation of taking out the gall-bladder, we have had all sorts of complications, even plenty of fistulae follow. Fistulae cases, I am sorry to say, usually come to Louisville from the smaller towns; some of these men in the smaller town hospitals have even taken out half of the common duct. We feel inclined to "pass the buck" by referring these cases back to the man who originally took out the gall-bladder. We have had to repair several that have been put off on us. However, tonight we are dealing with common duct obstruction, and I shall try to limit my remarks to this subject. It used to be that when we re-opened the gall-bladder wound, in most cases we found malignancy or small stones. Today, the recurring symptoms, are usually found to be due to adhesions that have followed the removal of the gall-bladder. We can not side-track the responsibility of exploring the common duct. I had an experience during the last few days which was unique. I operated upon a case that had never been operated before, and the patient was jaundiced. The gall-bladder was examined and no stones were found. Upon further examination, the hepatic and cystic ducts were found to be filled with stones. This case was unique. I do not recall how many of these stones there were, but about four or five were removed by suction. I decided to open the gall-bladder, and upon doing so there were no stones at all found in the gall-bladder. How do they get into these ducts? Probably from the liver. Cholangitis is usually associated with cholecystitis. It is a common thing today to see a common duct obstruction. In the earlier days we saw malignancy but today the most common thing in these cases is adhesions. When we have a common duct obstruction we must always have a jaundice. When we have these patients we must take time to drain that patient properly. The T-tube in an instance of this kind is certainly a very valuable instrument, but I do not stop here but open the gall-bladder, clear it of stones if they are present, put a "L"-tube in the common duct, a tube in the gall-bladder, and a cigarette drain in the lower pouch which gives patient a better chance to get well.

All common duct cases are very serious.

**Wm. C. Dugan:** I certainly enjoyed Dr. Strickler's paper very much indeed.

I am like friend John Wathen, in my early days we saw jaundice and we always considered disease of the gall-bladder. I remember a friend of your, now passed on, invited the late Dr. Cartilage and myself to see him operate on a gall-bladder for gall-stones, at the old St. Joseph's Infirmary. We went down, and found patient to be that peculiar kind that comes with icterus and colic, and that always means obstruction, not the painless jaundice

which one finds in malignancy. He opened the abdomen, and as my friend Wathen says there was no stone there, and we suggested that stone finally must be in the common duct. Subsequently, the common duct was opened where stone was found. The Doctor then said: "Boys you begged me to open this duct, now you have to close the damn thing." So we got into it.

I enjoyed the paper very much, as I did also Dr. Wathen's discussion of the subject. It is all new to me.

**E. S. Allen:** Dr. Strickler has given us a very interesting resume of surgery of the common bile duct. So thoroughly has the subject been covered, that little is left to say.

I think we all agree that a stone in the common or hepatic duct generally presents a serious surgical proposition. However, if the patient is thin, and thoroughly relaxed, and with an assistant who understands just what the surgeon is trying to do, who can keep a field well visualized, a common duct stone may not present such a formidable operation. The larger stone, and more dilated the duct, the easier its extraction.

An ample incision diminishes the technical difficulties.

A short fat patient, with dense adhesions in the gall bladder area makes for difficult exposure of the duct, and the hazard is increased if the anesthetist is having difficulty producing a relaxed abdomen. Dr. Strickler mentioned the danger of too great traction on common duct and gall bladder.

In a recent cholecystectomy, a slight oozing appeared at stump of cystic duct, by making traction on stump a suture was passed beneath duct and tied. A mass ligature to control what seemed a capillary oozing. The cystic artery and cystic duct had been ligated separately. It was not absolutely necessary to ligate this small bleeding area. The deep suture controlled the bleeding perfectly.

On the second postoperative day, the patient was jaundiced. The jaundice could be accounted for only by an accidental ligation of either hepatic or common duct.

The jaundice was more pronounced on the third day. Under gas anesthesia the wound was opened and the cause of jaundice was at once seen. A suture had pierced the hepatic duct and compressed it tightly against the cystic. The ligature was cut, releasing the hepatic duct. The ligature on cystic duct was also cut and fenestrated catheter inserted through cystic duct into hepatic, and wound closed.

Patient made an uninterrupted recovery, the jaundice disappearing almost as rapidly as its onset.

I believe this accident might occur oftener, and the icterus is attributed to an hepatitis.

I have transplanted the common duct into

stomach and duodenum, with very gratifying, temporary relief to patient, where a malignancy is obstructing at the diverticula of Vater.

Repair of the common duct is always a difficult technical procedure, and frequently followed by failure.

**Irvin Abell:** The essayist has given us a good resume of the surgery of the common duct. The latter may at times be relatively easy, at others extremely difficult. Considering all cases, the mortality may be counted as being not less than 10 per cent. The frequent presence of jaundice in common duct lesions materially increases the operative risk; we have resorted for its control to blood transfusions and intravenous administration of calcium chloride. While these measures have been of benefit, there remains a small percentage of cases in which they will fail to prevent post-operative bleeding. When the jaundice is profound, drainage of the gall bladder is present, if not, drainage of the common duct until the jaundice has been overcome, as a preliminary step, will greatly enhance the safety of further operative procedure upon the duct itself. At times one notes variations in the anatomical arrangement of the cystic and common duct, cystic and hepatic arteries, and the portal vein which add materially to the technical difficulty of operation upon the common duct. We have frequently noted anomalies in the arrangement of the cystic duct and of the cystic artery which if not recognized could conceivably have led to considerable difficulty. The common duct usually lies superficial to the vein; instances have been reported in the literature in which the portal vein was superficial to the duct. One can readily visualize the difficulty that would be encountered in such a case. In approximately 40 per cent of instances the common duct passes through and is entirely surrounded by pancreatic tissue before entering the duodenum, offering mechanical difficulty in removing stones or rendering accessible its terminal end. In such instances we have repeatedly approached the duct through a trans-duodenal incision, incising the duct at the ampulla of Vater to permit removal of stones impacted in its distal end. When the common duct presents but a single large stone its detection and removal is as a rule relatively simple. When, however, there are multiple stones and particularly when there is an associated dilatation of the hepatic ducts it is always difficult and at times impossible to be certain that all stones have been found and removed.

I would like to emphasize the advantage of joining the fundus of the gall bladder to the stomach or duodenum, in certain obstructions of the common duct. This procedure is as a rule not difficult and is capable of giving much relief in the presence of carcinoma of the head

of the pancreas, of carcinoma of the ampulla of Vater, in obstructions due to massive chronic pancreatitis and in strictures of the terminal portion of the common duct. We have employed it in three cases of carcinoma of the ampulla of Vater with temporary relief of all symptoms. One patient, a man of 65 years of age, had relief for a period of three years, at the end of which time he returned because of duodenal obstruction from the malignant growth. At this time a posterior gastro-enterostomy was done and he had another two years of comparative comfort, in all five years of relief from palliative measures. In a fourth case of carcinoma of the papilla of Vater the patient presented profound jaundice with an Icterus Index of 150 which was not decreased by preoperative treatment and preparation. He was given calcium chloride and transfusion. A trans-duodenal resection of the growth was done with an anastomosis of the common duct to the duodenum at the site of the resection; the patient died on the eleventh day from hemorrhage. Autopsy showed the suture line at point of implantation of duct into duodenum to have healed. I feel that we showed an error in judgment in carrying out the operation without a preliminary drainage of the common duct to overcome the profound jaundice. We have had three repairs of the common duct following injury: a first, end-to-end anastomosis without drainage of the duct was unsuccessful, the patient dying; a second, end-to-end anastomosis over a T-tube as mentioned by the essayist was successful and the patient still remains free of symptoms; a third, was done over an indwelling tube; in this instance we used a section of a No 20 French Catheter approximately three inches in length which projected into the duodenum for a distance of one-half inch and was anchored to the mucosa, with a No. 0 plain-catgut suture. Following the operation the patient had relief from jaundice and symptoms. At the time of her departure for home the tube had not passed. I wrote her family doctor telling him the type of repair which had been made and suggesting that he have the patient watch the stool for the tube. It is now one year since the operation and x-ray examination shows the tube still in place. While the patient is still symptom free I think it probable that sooner or later the tube will require removal.

Surgery of the common duct can be of the most difficult type, requiring unusual skill and judgment for cases where there is thickening and inflammation of the duct with adherence of surrounding tissue. There is not infrequently an associated pancreatitis and hepatitis, two important factors in the mortality in this particular type of surgery. It behooves one to take advantage of all of the factors for safety,



namely, adequate preoperative preparation, the selection of the operation suited to the individual case, and proper postoperative treatment.

**J. Garland Sherrill:** My experience with common duct surgery has not been as wide as some of the other men because we are leaving in the gall-bladders. We find that the causative factor is infection. Relief of gall-bladder symptoms lies in drainage. First, get out all the stones. Usually, the gall-bladder is small when a calculus is present in the common duct. When you have a cholecyst operation, you will find that you can relieve patient just as well by draining as by removal of the gall-bladder. Opening the common duct, and the insertion of a drain, is a safe procedure; a suction apparatus will take care of the gall-bladder very nicely, and this is one of the important things to have in these cases. Sterile bile in the abdominal cavity, causes little reaction; but infected bile in this cavity, gives considerable trouble. When you have removed the gall-bladder, it is remarkable how obstruction of the common duct will cause it to dilate. The fistula, following tube drainage, will not heal as long as the duct in its distal portion is closed. When you have a stone in the duct at the papilla of Vater, the trans-duodenal approach is best. When there is a stone in the common duct at this point, cut through the opening of the duct and get rid of the stone, then suture the intestinal wound. It will take care of itself.

**George A. Hendon:** The management of common duct obstruction, involves something more than the surgical removal of the prevailing obstruction. The case presents something more than a skillful feat of surgical engineering.

There are, at least, three very definite factors of a constitutional nature that demand careful and skillful consideration. They are kidney function, liver function, and hemorrhage. We have all seen patients of the icteric hue go upon the operating table, and the obstruction, (whether it be in the common or the hepatic duct) safely removed and adequate drainage established; but the patient thereafter, continued to show every increasing sign of vital depression, manifested by cold surface, cold extremities, subnormal temperature, weak pulse and gradually progressive coma, death closing the scene within about 72 hours after the operation. We also have the second type in which the obstruction has been completely relieved, adequate drainage established, the jaundice may or may not fade, but the urinary secretions are very disappointing, the patient passing less and less urine each day until uremic coma supervenes. The third type belongs to the hemorrhagic group in which succeeding the operation, general oozing, one of the greatest generals in history, exerts his baleful influence. Every time the dressings are changed, we find them soaked

with bright, red, blood and if they are not changed with sufficient frequency, the patient's clothing and bedding become saturated and the victim gradually sinks beneath the crimson tide to a painless, and a peaceful death. In dealing with the cases whose deficiencies of liver function may become fatal, we feel that the remedy of greatest dependence is the continuous administration of physiological amounts of glucose in solution administered at the physiological rate of delivery. Our favorite is 10% glucose in Ringer's solution to each 800 c. c. of which is added 1 gram of calcium gluconate. Of this we give from 4000 to 5000 c. c. each 24 hours by the process that we call Venoclysis. Our faith in the efficacy of this treatment is largely supported by the well-known fact that animals have been made to survive after amputation of the liver if an adequate amount of glucose is supplied in the proper manner.

Our treatment, therefore, rests on the theory that by the administration of adequate amounts of glucose daily, the liver is relieved of one of its most difficult tasks and obtains thereby, a partial suspension of function which enables it to restore its lost power. We consider 400 to 500 grammes of glucose daily, as the amount that should be administered to an adult, although we have given twice that much with apparently beneficial results. For the cases with dangerously diminished kidney function, we feel that a 5% solution of glucose in sterile water, administered by Venoclysis, in amounts of 4000 to 5000 c. c. daily, is the most reliable remedy. In the hemorrhagic cases, the preoperative preparation is the most essential. This should be accomplished by the continuous administration of Ringer's solution, in which should be added 1 gram of gluconate of calcium to 800 c. c. of Ringers which would make a total of 6 grams of gluconate of calcium per day. Glucose may or may not be included in this solution, according to the discretion of the operator. The day before operation, a pint of citrated blood should be given by adding it to the solution that is being used. The treatment should be continued following the operation until there is no apparent danger of hemorrhage. Therefore, if we supplant liver deficiencies with sufficient glucose, properly administered, and relieve the demands on the tired kidney and supply the ingredient essential to the coagulation of blood, much has been accomplished to fortify the patient against the burden entailed by a surgical operation for the relief of his obstruction.

**Benjamin Vaughan:** I should like to speak to the frequency of stones in the common duct. From the literature of the larger and better clinics, it is plainly seen that many patients operated on for gall-stones in former years had a stone left in the common duct; this is shown by the large percentage of stones that have been found in the common duct and removed in re-

cent years. One writer mathematically expresses it this way: "From the number of cases I operated on and the number of stones I found in the common duct prior to 1923, compared to the cases operated on and the large percentage of stones found in the common duct since that time, it would appear that in one out of every ten cases operated before 1923, I left a stone in the common duct."

**Frank P. Strickler**, (in closing): I appreciate the discussion of my paper very much. I was interested in finding out just how long some of these rubber tubes would stay in the common duct without becoming obstructed with bile salt. Consequently, I reviewed the literature on this subject rather thoroughly; and in speaking of Dr. Abell's case in which he sewed in a tube, he may have as long as thirteen years to go before the tube becomes obstructed and there are some cases on record in which the tube becomes obstructed in a few months.

I agree with the Doctor who spoke on the subject of gall stones. I think it is quite possible for any surgeon, no matter how capable, to occasionally leave behind a stone when operating. For the human equation is always present in any surgical undertaking and I, personally, have not met any one surgeon whom I have cause to believe is absolutely perfect.

I also agree with Dr. Hendon that death in these cases is due to the destruction of liver cells and the impairment of liver function brought about by the obstruction of the common duct. And of course, when the liver is damaged to such an extent it cannot function, the patient dies and it makes no difference in cases of this type, what surgical procedure is carried out.

#### **Jaundice: Osmotic Resistance of Erythrocytes**

—Geill made 155 determinations of the osmotic resistance of the erythrocytes in eighty-seven patients with jaundice due to pathologic conditions of the liver and biliary tract, especially acute hepatitis. The resistance, particularly the maximum resistance (total hemolysis), was increased in most cases; values down to 0.16 per cent sodium chloride were established. In acute hepatitis the resistance increased up to the acme of the disorder and decreased with the disappearance of the jaundice. No absolute parallelism was noted between the increased resistance and the degree of bilirubinemia. There was no relation between the erythrocyte resistance and the amount of cholesterol in the serum. The author describes a case of acute hepatitis that became chronic and in which cholemia was present without bilirubinemia. In the diagnosis an increased resistance of the erythrocytes in jaundice points to a jaundice of mechanical or functional origin; lowered resistance, to a hemolytic jaundice. A continued increase in resistance in hepatitis constitutes an unfavorable sign.

## **RABIES\***

ROBERT P. BALL, M. D.

Harlan.

From Department of Pathology, University of Louisville Medical School, Louisville.

Rabies is a disease so paradoxical in many ways it can never be uninteresting to a student of medicine. In the first place, it is a disease almost 100% fatal when once established and yet comparatively few people die of rabies. It is a disease which can be 100% controlled in any civilized country and yet we allow it to exist. The successful treatment is entirely by acquired immunity and yet we do not know the causative agent. It is the only disease I know which can be successfully prevented by immunization after the body is infected. And lastly, it is one of the few diseases for which there is no claim for efficacious drug therapy.

Hippocrates is said to have made no mention of the disease but Aristotle is said to be credited with knowledge of it. Five hundred years later, the first century A. D., Celsus gives an extended description of the malady. Caelius Aurelianus and Galen in the second century A. D., described it very well. As was customary in the writings of the middle ages, they merely handed down the opinion of their predecessors. In 1771 Van Swieten appears to have recognized the paralytic form of rabies in man. In 1804 Zinke first successfully demonstrated, experimentally, the virulence of the saliva of dogs and other animals affected. Magendie and Breschet are credited with the first actual demonstration of the identity of the disease by its transmission from man to dog through the saliva. This important demonstration was published in 1821. In the subsequent years many experiments were carried out to show the disease to be an infection as we now understand it, transmitted by the saliva of rabid animals through bites.

The paradoxical nature of the disease prevented rapid progress in unraveling many of the perplexing problems encountered until Pasteur began the study of rabies. Pasteur's assistant, Roux, upon his own initiative, inoculated subdurally the brain of the dog with an emulsion prepared from the brain of a rabid animal. This proved a 100% method of transmitting the disease and eliminating the confusion arising from the variable number of animals which would become rabid when inoculated subcutaneously or bitten by rabid animals. The modern investigation of rabies dates from this experiment.

After more than three years of patient toil, devoted almost exclusively to the study of

\*Read before the Jefferson County Medical Society.



rabies, Pasteur and his assistants, Roux and Chamberland, submitted their work to a medical commission of France who verified their results and claims of acquired immunization against rabies. On the night of July 6, 1885, a 14-year-old boy, Joseph Meister, received the first injection of rabies vaccine ever administered a human being. This boy had received several gashes from a mad dog two days previously. He never developed rabies.

Shortly after this, nineteen Russians were brought to Pasteur after they had been bitten by a mad wolf two weeks previously. The percentage of takes following a wolf bite were 80%. Without treatment, fifteen could be expected to die. After Pasteur's treatment, sixteen of the nineteen Russians went home without developing rabies. Today we rarely think of rabies as a dread disease. But let me recall to you the reaction of the world to this demonstration of an efficacious treatment of rabies. The Tsar of Russia sent Pasteur the diamond cross of St. Anne, and a hundred thousand francs. From every country on the earth came money, amounting to millions of francs, which was used to build the Pasteur Institute.

A perusal of the literature of rabies is very interesting in many ways. It shows unusually intelligent observation and also the wildest superstitions and erroneous beliefs imaginable. In the work of Kugelstein's, 1826, are found the following observations: "That long haired dogs had rabies less frequently than short haired ones, an observation explainable by the mechanical removal of the infectious saliva by the hair; that young dogs were susceptible, at one time doubted, but now a known fact; that the saliva of rabid dogs may be virulent before the symptoms have appeared; that the fear of water is rarely observed in rabid animals; that rabid dogs are frequently more playful at first; that mad dogs are not necessarily wild eyed; nor do they always froth at the mouth or carry the tail between the legs." (Stimson).

The superstitions and fallacies of ancient days are in some sections of the country still entertained. They are too numerous to mention. One interesting historical edict of Frederick the Great provided for the removal of the "mad worm" from the tongue of dogs to prevent rabies. This is a normal cartilage in the tongue. Avicenna believed the little figures of dogs, in reality blood clots, passed in the urine after administering cantharidies was the cause of rabies. The "mad stone," so popular until recent times, consists of calculi obtained from the intestines of lower animals and is mainly calcium phosphate. This was applied to the wound and said to "draw

out" the poison. The most exasperating belief to the bacteriologically enlightened of to-day is the still prevalent idea of the spontaneous origin of rabies. Among the causes given are: Sudden suppression of lactation in female dogs; eating decayed meats; withholding meat from dogs accustomed to it; extremes of temperature; ungratified sexual instinct; drinking unclean water, etc.

Rabies is transmitted to man by the bite of an infected animal. The warm-blooded animals are all susceptible, even fowls, though the high temperature of some fowls seems to protect them. It is considered, and rightly so, a disease of the dog family. Yet other animals transmit the disease to man, including the cat, fox, coyote, horse, sheep, and etc. The incubation period is variable, apparently depending upon the proximity of the point of entrance to the central nervous system. In man the average time is seventy days. There is no apparent seasonal variation except habits of individuals which increase exposure to infection.

The causative agent is not known. A filterable virus has been verified. The presence of so-called Negri bodies in the pyramidal cells of the brain and ganglion cells, notable in the hippocampus, is a fairly constant finding and the best known laboratory procedure for diagnosis. The infective agent is thought to be a protozoan and because of the benefit in drug therapy in other protozoan infections there is a possibility of relief by this method. Since vaccination can only cure before the onset of symptoms, the search for a specific treatment should continue.

The clinical manifestations of rabies are conveniently divided into three stages: (1) prodromal, (2) excitement, and (3) paralytic. The prodromal stage in man is shown by irritability, pain at the site of inoculation, insomnia and psychic disorder. The excitement stage is the most pitiful and distressing. The patient will be extremely susceptible to stimuli and suffer convulsive seizures, most pronounced in the muscles of deglutition and respiration. In this stage the sympathetic nervous system may show unusual excitation with a marked glandular activity, notably the salivary glands. The paralytic stage, the merciful stage, ends usually with paralysis of the respiratory center. The diagnosis in man is not difficult with a history. It might be confusing or overlooked without a history. The diagnosis in the lower animal is more uncertain than in man. For this reason it is very important to observe suspected animals if possible. Subdural animal inoculation tests are the most accurate means of diagnosis.

The treatment of rabies infection with the fixed virus vaccine is too well known for

elucidation. It must be given immediately if possible. The prophylactic treatment should be the only treatment necessary in this continent. That should be by strict observance of the law requiring the muzzling of dogs. No other animal is as intimate psychically and physically to man as the dog. Such rules and regulations should appeal to both dog lovers and humanitarians. The neglect of this simple remedy for such a dread disease which is 100% fatal, reflects upon the logic and intelligence of ourselves and contemporaries.

### PATHOLOGY OF RABIES AND CASE REPORT\*

A. J. MILLER

Louisville.

The post-mortem findings in rabies are quite varied. None of them are specific except the finding of Negri bodies in the cytoplasm or processes of nerve cells. The favorable location for them is the hippocampus major, but they are also found in the cerebellum, motor area, other parts of the cerebral cortex, and in fact all nerve cells, including the sympathetic ganglia and the posterior root ganglia.

The exact nature of the Negri bodies is not known. It was thought by Adelchi Negri, who first described them, that they were the causative agent. This view is still entertained by many. Their size varies from  $\frac{1}{2}$  to 30 micra. Partly because of this extreme variation in size it has been suggested that the Negri body is a mass of nerve cell cytoplasm changed by the localization of the virus there. This virus is one of the first to be known as a filterable one and these larger masses obviously could not pass thru an earthen filter. The Negri body is spherical or slightly elongated, stains readily with Fuchsin, and if counter-stained, with Methylene Blue, will show one or more small blue granules. These granules may be the virus around which the homogeneous material is formed from the tissues. The morphology is constant, varies regularly with the stage of the disease and conforms to that of certain known protozoa.

Similar bodies are found in distemper, but they are never granulated.

Other post-mortem findings in the brain consist of small hemorrhages about the small vessels, simple chromatolysis of nerve cells, and small collections of lymphocytes about the vessels. These, however, may be found in many conditions.

Most always there is marked emaciation

and dehydration as a result of the patient's inability to take food and water. The stomach frequently contains all sorts of foreign bodies, such as wood, buttons, pebbles, pieces of clothing or paper. This is also noted in animals. It is the result of a perverted appetite in the early stages. The mucosa of the gastro-intestinal canal is hemorrhagic and congested. This is probably agonal and also is not specific. It was once suggested that the passing of the virus from the blood into the lumen of a bowel caused this condition, but there is no reason to support this view. It is true that the virus can be demonstrated in the mucosa and content of the gastro-intestinal tract, as well as the salivary glands. Negri bodies are not found here, however.

Case Report: About the middle of August 1929, the patient was bitten on the thumb by a dog. (The dog was a stray one and its subsequent history is unknown). The tooth went through the thumb nail and the wound healed readily. About the first of November the patient complained of the bed hurting his back, so that he would arise at 3 or 4 o'clock in the morning. About the same time the mother noticed that the patient would worry about trivial things. On the 15th of November the patient complained of pain in the hand that had been bitten. The pain radiated up the arm and was drawing in character. For the next three or four days a marked irritability was noticed and on the 17th of November he stated he felt sick. He complained of feeling chilly and as though he might vomit. He ate less food than usual and refused to play. The night of this day he spent tossing about in bed without sleep. The next day, because of his loss of appetite and the feeling of nausea, he was given salts and castor oil. At the breakfast table he spit up a quantity of mucoid material, refused food and water. From then on he steadily refused water and resisted drinking when an attempt was made to force it. The restlessness and irritability continued until the 19th of November, the day of admission to the hospital when it was described as maniacal.

Past medical history revealed malnutrition for the first year, measles at 3, chicken-pox at  $3\frac{1}{2}$ , mumps at 6, and tonsillitis every winter for the last three years.

Physical examination: Revealed a white boy nine years of age, tossing about, extremely irritable and having attacks in which he writhed as though frightened. These were precipitated by any attempt at physical examination. The eyes had a staring expression and the pupils were dilated. There was no drooling of saliva, but the mouth contained very thick mucous. The neck was slightly stiff, and all muscles seemed hyper-tonic. Study of reflexes was unsatisfactory

\*Read before the Jefferson County Medical Society



because an attempt to elicit them would initiate an attack of writhing movements which ceased after a time and then the patient would be quiet. There was no scar found on the thumb. Skin dry and inelastic.

Laboratory Findings: W. B. C., 18,700. Polys, 90%; lymphs, 9%; large mononuclears, 1%; R. B. C., 4,740,000. Hb., 85%. Urine negative except for one plus albumin. Wassermann negative. Blood culture negative. Spinal fluid—no positive findings. Temperature varied from 102.6 to 105.4, pulse from 13 to 154, and respirations from 26 to 38.

During the patient's stay in the hospital he refused to eat or be fed or to take water. He was quiet most of the time except when disturbed for the taking of temperature or examination. At these times, writhing, convulsive movements with short, rapid respiratory excursions would begin and last for thirty seconds or so, when they would gradually disappear. The patient would relapse into stupor which later deepened into coma. Death occurred on the third day after admittance to hospital, on November 22.

Post-mortem was performed by Doctor R. P. Ball about three hours after death.

The body was in a poor state of nutrition.

The mediastinum was displaced slightly to the left. There was marked emphysema of the lungs, mediastinum and subcutaneous tissue of the lower part of the neck. This was interpreted as a result of the convulsions.

The peri-bronchial nodes on each side were scarred and large, evidently the result of tuberculosis, but not active at the time of death.

There were petechiae in the pericardium. These are common in deaths in which, for any cause, the respiratory function is insufficient.

The brain was normal grossly, but Negri bodies were found in moderate numbers in the cerebellum and the hippocampus major. There were no hemorrhages, or cellular infiltrations of any sort. Chromatolysis was marked.

Cerebral cortex was emulsified in salt solution and injected into the brain of two dogs, three rabbits and three guinea pigs. On the 17th day after inoculation one rabbit could not stand or hop, apparently because of incoordination of muscular movements. The next day it was paralyzed in the hind quarters. The other rabbits and guinea pigs became affected similarly. The dogs became irritable. This was first shown by their snapping at the mop when their cages were cleaned. They became restless, refused food and water, finally stuporous and died. They were observed by a veterinarian and diagnosed as rabies. All of these injected animals died with symp-

toms of rabies. All were examined post-mortem and typical Negri bodies found in the brain of each one.

## DISCUSSION

**Vernon Robins:** It is my pleasure to speak a few words on this subject. I am very greatly pleased to have heard this essay and the report of the autopsy by such competent investigators.

In this case, my assistant, Mrs. Carpenter, and I saw the Negri bodies in the nerve cells of the brain. The City Health Department was represented by Dr. Desha Harris and myself at the autopsy. The true character of the disease was thoroughly established in a scientific way by Dr. Ball.

I wish here to allude to the occurrence of one case of human rabies (Mrs. Everhard, 38th and Market Street), occurring some months later. She had been bitten by a dog that at the time had also bitten numerous children in the neighborhood and the children had all taken the Pasteur treatment with happy results. She did not consider her injury a matter of special consequence although aware of the fact that the same dog had bitten the children who had been given the treatment. The first information that Dr. Simrall Anderson, her physician, had was the occurrence of suspicious symptoms about forty-five days after the injury of the hand. After a few days she died, although Pasteur treatment was immediately given. No autopsy was permitted. Many of the men of our medical profession saw this case.

Rabies is rarely seen in the human, and it is almost always fatal after symptoms have started. All dog bites are thoroughly investigated and Pasteur treatment given promptly when the dog's brain shows the presence of Negri bodies and the treatment is always advised in those cases when the dog cannot be secured and held for observation, or when the dog's brain is far too decomposed for microscopic examination. We require the keeping under close confinement all dogs suspected of rabies for twenty-one days before release and our city veterinarian has constantly a very considerable list of these animals he is observing before release\*. It is rightfully esteemed a fearful disease.

Number of dogs under observation during year 1930, 610.

Number of dogs under observation from January 1, 1931, to present, 726.

Number persons receiving Pasteur treatment in 1930, 94.

Number persons receiving Pasteur treatment from January 1, 1931, to present, 159.

Number dog heads examined for 1930, 117. From January to January, 41% of which were positive.

\*Each year about 40% of the dog heads sent in from the city district show the Negri bodies in the brain.

Number dog heads examined from January 1, 1931, to present, 106, of which over 37% were positive.

The anti-rabies medicine costs \$9.38 for one complete treatment. Total cost for such rabies medicine for 1930 was \$881. The total cost for rabies medicine for the year 1931, from January to the present, \$1,491.

We have an ordinance law requiring muzzling for three months in the year that never was enforced fully. A provision should be made for year around enforcement and until such time as rabies has practically disappeared in dogs. Failing such law, the next remedy is a more effective gathering up of stray dogs and impounding them. The high grade dog could then be redeemed by permit of a fee and the others put to death.

I wish to leave in your mind the need to prevent serious wounds caused by dogs' fangs, the terror that such attacks often produce in the mind of the child, the heavy cost of money for rabies medicine, the pain and fear caused by the inoculation which is not inconsiderable, since the complete treatment is fourteen days, and finally the cost of time in the laboratory hunting for Negri bodies in the brain in cases that finally prove to be negative.

**Leon L. Solomon:** I would like to ask Dr. Miller how long after the bite through the finger before this little fellow showed signs of irritability?

**T. Cook Smith:** This report is particularly interesting to me because I attended the child while here in the City Hospital. My impression after examination was in favor of a diagnosis of some form of encephalitis. I was prejudiced against the diagnosis of rabies, inasmuch as I had never seen a case. Seeing the patient day by day, I was convinced that this was some form of encephalitis other than that usually encountered. The history as first obtained was very indefinite, and on careful questioning it was shown that the child was bitten by a stray dog in the neighborhood several weeks preceding the onset of symptoms. I think we should congratulate the essayist and pathologists, as they have given us an unusual scientific report.

I would like to ask Dr. Robbins if he has had any complications whatever from administration of serum.

**Armand E. Cohen, Louisville:** The society is to be congratulated for having the privilege of hearing this excellent paper presented by Dr. Ball and Dr. Miller.

The increased incidence of rabies, in the United States, particularly in Kentucky and the Central States, is of considerable interest. The loss of live stock and the expense of treating man and animal for this obviously preventable malady costs the country millions of dollars. Likewise the cost of human life is not inconsiderable. It is most fortunate that the human

immunity to this dread infection is relatively great. It is estimated that only from five to sixteen per cent of individuals bitten by a rabid animal would contract the disease even though Pasteur's treatment were not instigated. It is likewise fortunate that in the human cases reported the dog has been responsible for over 90% of the cases and control of this source can practically eliminate the human incidence of the disease.

In the city of Louisville we are fortunate in having a local Board of Health keenly alert to the situation. From my own experience during the past year when I had the occasion to report two cases of individuals suffering from dog bites, less than three hours after the Board of Health was notified the city veterinarian called, stating that the dogs had been placed under quarantine.

The fact should be emphasized that animals suspected of having rabies should not be killed, but should be isolated and their symptoms observed. Unfortunately some individuals in a vindictive mood may kill a suspected animal—before that animal develops Negri bodies—indicative of Central Nervous system involvement and the criteria by which a positive diagnosis can be made. Under such circumstances improper diagnosis and dire consequence might result.

While it is commonly believed that rabies is more prevalent during the summer months, statistics indicate that it is just as prevalent in the winter months and apparently is much more virulent.

Another common fallacy is that the lay term, "Hydro-phobia" (fear of water) is descriptive of the symptomatology of the disease. Rabid animals do not fear water. They will run through it and will drink freely until paralysis sets in. Often the classical picture of the "Mad Dog" is more descriptive of a thirsty dog, who bereft of decent care and attention during the hot summer days becomes crazed with thirst and fear.

Unfortunately, there are individuals whose sensibilities are shocked by such common sense public health measures as muzzling or immunizing valuable animals, and impounding and gassing the strays, yet are not cognizant of the tremendous economic waste or the horrible human suffering that might be entailed by any other plan.

**Harry M. Weeter, Louisville:** I think Dr. Ball's paper would make a mighty good chapter for a textbook, and he is to be congratulated upon his presentation.

In answer to Dr. Smith's question regarding the after effects of treatment about eight years ago at the children's Free Hospital there was a case of paralysis following Pasteur treatment resulting in death. The terminal cause determined at autopsy being a pneumonia. We were unable to examine the head for Negri bodies.



**A. J. Miller,** (In closing): The incubation period of rabies varies from three weeks to seven months. Cases diagnosed as rabies, with an incubation period of more than seven months are doubtful.

The seasonable variation of rabies is very slight.

I cannot tell you just exactly when Negri bodies appear but virus is detected before Negri bodies are found in the brain, and it is my impression that Negri bodies are found almost without exception.

Negri bodies are not found in the saliva, nor in the gastro-intestinal tract. The virus as far as we know has never been seen outside the central nervous system.

### AN INTERESTING CASE OF CHOREA\*

JAMES H. PRITCHETT, M. D.

Louisville.

The following case report is presented not in any sense as a contribution to the newer lines of treatment, but merely because of two or three interesting factors, and also in the hope that it may stimulate interest along a more recent line of treatment.

M. H., female white, 7 years, family history unimportant. Personal history: Has been strong and healthy, has had no diseases of childhood except pertussis, is above the average in intellect and has been somewhat eccentric. At the age of 5 years she developed attacks of "day dreams," described by the mother as occurring many times a day. She would stare fixedly, or if in conversation, would stop suddenly and then somewhat in a daze would continue. Or if at play, would whirl around somewhat awkwardly, then resume her game. These attacks, thirty or more a day, never lasted more than one half to one minute. Her family physician told the mother the child had petit mal. Some two years later, or in May, 1931, the attacks suddenly ceased and have not as yet recurred. During the latter part of August, according to the mother, she developed sore throat, and though moderately severe, she was not confined to bed. Shortly after this time there was pain in the knee, which the mother thought was due to some injury incurred while at play. This, I think, however, was probably an arthritis. Early in September she entered school, and after very indifferent work for some time, was taken to task very severely by the teacher. She became fretful, cross, cried easily and became more and more nervous. Then she developed, about the middle of September or slightly after, typical choreiform movements. She was taken from

school but was not confined to bed and was not seen by a physician.

I saw the girl early in October. At that time there was constant jerky, irregular, involuntary contraction and relaxation of the muscles. Also at times she uttered a bark-like moan. She was admitted to the hospital and placed under the supervision of a special nurse. Her blood picture was leukocytes 17,800, red cells 4,500,000, hemoglobin 75 per cent. Luminal and later amytal gave little if any relief. So I decided to work along the line of treatment as outlined by Sutton in the "Journal A. M. A., August 1, 1931, page 299" under the caption of "Treatment of Chorea by the Induction of Fever," preliminary report. Dr. Sutton found somewhat by accident that fever seemed to exert a most beneficial effect on chorea. In order to produce a reaction and fever they gave intravenous injections of typhoid vaccine, later a change was made to typhoid-paratyphoid, in doses of from .2 to 2.5 cc. Three or five injections at two or three day intervals were given. Their results in a series of cases at Bellevue have been most striking. I decided to use a somewhat similar agent. In conversation with Dr. John Allen, we discussed this question and agreed that some preparation containing streptococci might be of value in producing a reaction. Dr. Allen gave me streptococci bacteriophage. I gave four or five injections of this preparation intramuscularly  $\frac{1}{2}$  to 2 c. c. at two-day intervals. The reaction produced was drowsiness, and temperature 101-103 which lasted about three hours. No spectacular results were noted, but there was a marked though gradual improvement, and in the short period of ten days the condition had changed remarkably. So much so that the father and mother, against my wish, decided to return to their home out in the State.

#### COMMENT

Two theories are advanced as to the etiological factors in chorea. First: That it is of infectious origin, being closely related to rheumatism and tonsillar infections. This is the generally accepted view. Second: That it is of nervous origin. In this particular case, what, if any bearing did the petit mal have? Also, how much importance should be given the fright factor? Again, did the attack of tonsillitis, mild though it was, have a direct bearing. I am of the opinion that the tonsillitis started the trouble and that the scolding precipitated matters and that the lack of rest intensified the condition. My own explanation as to the modus operandi of such a treatment is that the bacteriophage exerted a direct and somewhat specific effect and that the fever produced acts as a sedative to

\*Read before the Jefferson County Medical Society

the cerebro-spinal system. I believe much better results would have been obtained had the intravenous method been used. In the event of such a case confronting me in the future, this would be the route of choice.

#### DISCUSSION

**J. J. Moren:** Dr. Pritchett has given us a very interesting report, and if the suggested treatment is of service it would certainly be a great aid in the treatment of chorea, especially as so many of them are likely to last six weeks or more.

Dr. Pritchett's success is in keeping with the report made by Dr. Sutton. The history of petit mal is interesting, and in view of the fact that the child was relieved of these attacks I doubt if they were of the petit mal type.

It is common to find the history of a fright or shock of any kind precipitating chorea. The history of a sore throat and pains in the joints is suggestive that some infection was at the bottom of the chorea. Rheumatism, endocarditis and chorea still run together, and some writers look upon chorea as "cerebral rheumatism." It is pretty well accepted that chorea is the result of an encephalitis, but the germ which causes it has not been determined.

As to the plan of treatment mentioned by Dr. Pritchett, I have had no personal experience. Several years ago such procedures were advocated in the treatment of the epidemic type of encephalitis. Various foreign proteins were used and were favored for a time by the continental doctors but their results have been no better than various other forms of treatment. Whether such treatment was used in the particular choreic type of encephalitis I cannot answer. It might be in those particular types, with choreic manifestations, that such treatment would do good.

**S. C. Frankel:** It occurs to me that if pyrexia is what is desired in cases like this case report, it could be produced in a much easier way than by the giving of proteins or vaccines. We have in the form of sulphur in olive oil, a combination that can be administered intramuscularly with increasing dosage, which will produce a pyrexia ranging from 101° to 104° F. This solution in one to two per cent given on alternate days in increasing dosage results in the patient having pyrexia easily controlled. This solution is now used in paresis and in a number of other diseases of the central nervous system in the place of inoculating the patient with malaria plasmodium, and is especially useful in those cases where the physical condition will not permit, with safety, the production of malaria.

**W. E. Gardner:** I am very glad to have heard Dr. Pritchett's report and want to congratulate him upon the success he had in the treatment of this case. Anything, as Dr.

Moren has said, that offers relief in the treatment of chorea certainly commands our interest; and while we have heretofore seemed to get good results in the treatment of chorea by rest, salicylates and sedatives, we should bear in mind that a good many cases of chorea of apparently short duration may have a tendency to relapse and be prolonged for a number of weeks. It is interesting to note that the duration of symptoms has been very much reduced by the use of TAB vaccine, according to Dr. Sutton's report in the "Journal of the American Medical Association," to which Dr. Pritchett referred; and it does seem that either the foreign protein or this bacteriophage as used by Dr. Pritchett undoubtedly shortens the course of acute chorea. I believe that acute chorea is due to some form of streptococcic infection, inasmuch as the administration of salicylates seems to have a very beneficial effect in controlling the disease. This child was given the benefit of both the pyrexia and the stimulation of the antibodies from the injection of foreign protein. I do not believe that it is the fever, alone, that has the beneficial effect in these acute conditions, as well as the more or less chronic types of inflammation of the central nervous system such as paresis or multiple sclerosis; but that the stimulation of the antibodies, or the defense mechanism, is an important factor, along with a possible specific action of the streptococcic bacteriophage, as reported in this particular case.

There is said to be two types of chorea in children; one characterized by a degenerative process and the other by an inflammatory process. The latter, as Dr. Moren has stated, is closely related to encephalitis and some of these cases, of course, may go on for a number of weeks and occasionally result in death. The majority of cases of chorea, however, if put to bed, kept quiet and given symptomatic treatment last from six to ten weeks. If given trional and salicylates, this time may be very materially reduced.

Dr. Sutton's paper in the "Journal of the American Medical Association" and Dr. Pritchett's report of the successful outcome of his case treated by the use of streptococcic bacteriophage, offers us a great deal of encouragement in the better handling, particularly, of some of our stubborn cases of chorea which do not respond to the usual treatment.

**J. H. Pritchett,** (in closing): As both Doctors Moren and Gardner have pointed out, it is the reaction to a protein and the increase in antibodies, which caused an amelioration of symptoms; the temperature is but a part of the reaction.

Concerning the relation of chorea and encephalitis, we can only surmise; it may be quite possible that encephalitic manifestations are entirely choreic in origin.

The use of sulphur, as suggested by Dr.



Frankel, is indeed interesting. The drug which produces a temperature and a reaction at the same time is the one of choice. Such a drug as phenyl-ethyl-hydantoin is used generally, but as stated in case report, it is not without danger.

Dr. Allen's point as to the tonsil function, is important. Unless the tonsil is actually diseased, I doubt the wisdom of removal just because the child has chorea; however, in the presence of frequent attacks of tonsillitis and the child is choreic, the rational procedure, it seems to me, would be removal.

### UNUSUAL FRACTURES\*

FRANK P. STRICKLER, M. D.

Louisville.

The first case is that of a girl, age 25, who injured her left shoulder by falling from a moving automobile. I saw the patient in consultation with Dr. Harold Miller and at first it appeared to be a dislocation of the shoulder. The injury was very painful, which limited physical examination. The final diagnosis was made by x-ray. The case proved to be a fracture of the neck of the scapula which did not extend into the glenoid fossa. Fractures of this type are very rare and this case is reported for that reason. The case was treated by abduction and traction in a Thomas arm splint. The results were excellent, the patient obtaining practically normal motion in the shoulder.

Case No. 2 is one of a compound, comminuted fracture of the lower third of the left tibia complicated by gas gangrene. When I first saw this case, three days after his injury, he was in the hospital. On entering his room I encountered the peculiar, sweetish odor characteristic of these cases and well known by all of you who saw service in France.

The patient was wildly delirious, with a temperature of 104.5°F., pulse 150 and very weak. The leg was very much swollen and purple. On removing the dressings one was more forcibly struck by the characteristic odor. After observing the wound for a few minutes small bubbles of gas were seen to escape from the wound. The patient's condition was very serious and immediate operation was decided upon.

Two ampules of bacillus Welchii and bacillus Perfringens antitoxins were given at once, one intravenously and the other into the muscle. Under gas anesthesia the lower leg was widely incised in several places. Smears and cultures were taken from the wound and hot packs of 1-1000 potassium permanganate applied. The leg was put up for the time being in a wire mesh splint.

The patient's condition was extreme and we did not expect him to live.

The next morning on reaching the hospital I was gratified to find the patient's temperature to be 99°F., pulse 80, with good volume, and his condition good, a very striking change over the previous evening.

The patient was given another gas anesthesia, a Steinman pin was placed through the os calcis and the leg put up on a Bohler leg splint with traction applied in the usual manner. The wet dressings of 1-1000 potassium permanganate were continued and several more doses of anti-toxines were given. The case ran its typical course of muscle sloughing, etc. The smears and cultures taken at the first operation confirmed the diagnosis.

Patient in due time obtained a union at the site of the fracture and will eventually have a good weight-bearing leg.

This case is reported to call your attention to the striking results obtained from gas gangrene antitoxin and with the hope that it will help to save a few limbs which might otherwise be amputated.

In closing I would also like to call your attention to the fact that there is on the market at this time a combined gas gangrene antitoxin and tetanus antitoxin which is given as a prophylactic. It is needless for me to say that all injuries of the type reported should receive this combined antitoxin as a prophylactic.

### DISCUSSION

**Leon L. Solomon:** Without meaning to discuss the paper of Dr. Strickler from the standpoint of one as familiar with the subject, as the surgeon must be, because Dr. Strickler makes reference to the characteristic odor in the case reported, I feel justified in saying a word in reference to the use of the sense of smell as a diagnostic aid.

I fear sufficient emphasis is not placed today by teachers of medicine on the importance of educating the olfactories of the doctor. We are in the habit of attaching proper importance to the special sense of sight, and we are inclined to award the sense of touch a proper place in the important department of diagnosis. Much has been written about the *Tactus Eruditus* of the physician. Too little, on the other hand, is said about the educating of the special sense of smell. At this moment I recall an incident in the life of that great teacher and surgeon, David Yandell. It has been said of him that none had a more acute sense of smell. The facts are as follows: Dr. Yandell boarded a west-bound car at the corner of Seventh and Broadway; it was in the days of the muledrawn car. The time was winter. Cars were without means of heat; straw on the floor served to absorb moisture from the shoes of passengers and suggested

\*Read before the Jefferson County Medical Society.

the thought of warmth. The car naturally smelled after the straw, but not so strong as to nullify the odor of smallpox, which was immediately detected by Dr. Yandell. For the benefit of those who have never seen a case of smallpox, it may be stated that the peculiar odor of the disease, when the pustular stage is reached, is considered characteristic—it is a so-called mousey odor, very much resembling the smell of the bed of the mamma mouse, in which she snugly takes care of her babies.

Certain that he had made no mistake and that there was smallpox in the car at the moment, or that it had but recently been in the car, the physician set about to locate the sufferer. Dr. Yandell was a fearless man; he was a law unto himself, so far as behavior and deportment were concerned. And walking through the aisle, with passengers seated on either side facing each other, he smelled of each man, woman and child, taking a long, deep inspiratory whiff, as he walked back and forth, from rear to front and from front back to rear. And just as the children play the game of "Salt, Pepper, Vinegar, Hot," certain that his olfactories had not deceived him, he stopped by a lady, dressed in deep mourning, with a heavy veil hanging from head to floor. In voice loud enough to be heard throughout the car, he said: "Madam, you have smallpox; you must leave this car immediately, and I will go along with you." The driver noted the commotion in the car, and seeing the people as they hurriedly disembarked, without waiting to ring the bell and bring the car to a stop, inquired the reason and was quietly told by Professor Yandell that there was nothing wrong, that a lady had smallpox and he would take care of her. Self-protection being nature's first law, the driver proceeded to take care of himself. He brought his car to a hasty stop, he locked the brake by shoving with his toe against the tongue, which fitted snugly in the notch; he then securely tied the mule's back against the brake, while he leaped over the dashboard and hid himself hence. As Dr. Yandell afterwards told the story on himself: Inquiring of the lady where she lived, and learning that her residence was on Broadway beyond Eighteenth, he told her there was no reason for her to leave the car, since everybody else had gone; he released the mules, removed the brake, assumed charge of the car and drove it to Eighteenth and Broadway without permitting a new passenger to come aboard. The car was driven into the barn, the lady was accompanied to her home where she told the story of having contracted smallpox away from home and having secured mourning attire as a disguise, in order that she might get back to her house without molestation. She had, of course, not counted correctly, since the tell-tale odor of the disease, in its pustular stage, was not to be overlooked by a man whose sense

of smell had been educated.

I have taken great pains to educate my sense of smell. It has served me many good turns. I recall a pregnant woman, who was constantly smelling odors. Deoderants were lavishly used by her so that I had not been able to use my sense of smell with any degree of satisfaction. Pregnant women, as is well known, not infrequently suffer from a neurotic condition in which they smell, or think they smell, various and sundry odors. Finally persuading my patient to leave off the use of lysol, carbolic acid, and other loud-smelling deoderants, I promised to assist her in finding just what it was that seemed to smell so offensively to her. I had previously thought that her over sensitiveness was a part of a pregnancy neurosis. To my satisfaction and her mortification, the odor was found to be a nest of dead mice in a bureau drawer. The mother had been caught in the trap some days previous and the babies dying of starvation, their bodies underwent putrefactive change, productive of the nasty smell.

All of us are familiar with the odor of ischio-rectal abscess; none of us can forget perinephritic abscesses, where colon organisms are abundant. The smell of pulmonary abscess is usually characteristic; the odor of the old man's bladder is not to be forgotten; the peculiar stench of the lochia, after five or six days, is characteristic; once smelled, you are not likely to forget the odor of the patient, salivated with too much calomel or persistent use of bichloride internally, or unguentum hydrargyrum used in a series of twenty-one inunctions. About the worst smell I ever detected was the stench from the mouth in a patient, who, in a drunken brawl was thrown by his wife down the rear stairs and had an ugly punctured, lacerated wound of the lower lip, caused by his own teeth.

And so I might continue to emphasize the importance of the sense of smell, which the doctor should ever strive to develop and to keep delicately attuned.

**George A. Hendon,** The most important phase of Doctor Strickler's report as it presents itself to me, is the lesson that it teaches of conservatism in the treatment of fractures. The fact that he was able to preserve both life and limb in a compound fracture, infected with gas bacillus, denotes remarkable advancement in the treatment of such injuries. The profession as a whole, is peculiarly sensitive regarding fractures of long bones. This no doubt grows out of melancholy history of fractures in the pre-antiseptic days when a compound fracture meant an amputation and mortality of all amputations was from 40 to 50%. We cannot help but be impressed with Doctor Strickler's report when viewed in comparison with the methods and results in like situations that were in vogue as recent as 10 years ago.



## INTERLOBAR PLEURISY WITH SERIOUS EFFUSION\*

OSCAR O. MILLER, M. D.

Louisville.

In a consideration of interlobar pleurisy it may be well to briefly review the anatomy of the lung and its pleural investment. Each lung is divided into two lobes by a long and deep fissure which extends from the upper part of the posterior border of each lung about three inches from its apex, and corresponding to the fourth dorsal spine on the right and the third on the left, running obliquely downward and forward to the lower part of the lung just external to its anterior border; (underlying the sixth rib) and penetrating nearly to the root of the lung. On the right the upper lobe is partially subdivided by a second shorter fissure, which extends almost horizontally forward from the middle of the preceding fissure to the anterior margin of the lung; externally it corresponds to the fourth interspace, beginning anterior to the posterior axillary line and terminating at the fourth costal cartilage. The left fissure is more vertical than the right. The lung is invested by the pleura which extends to the root and is then reflected over the inner surface of the thorax. The visceral pleura dips into the fissures between the lobes. The pleura according to William Snow Miller,<sup>2</sup> consists of four layers, an external mesothelial, submesothelial, elastic and areolar layer contains the blood vessels, lymph vessels and nerves; and is made up of bundles of collagenous fibres, scattered elastic tissue fibres, and a network of reticulum. Prolongation of this areolar layer extends into the lung to form septa, that mark out secondary lobules. The lymphatics are numerous in the pleura and it has been erroneously stated that many of these lymphatics are in direct communication with the pleural cavity by stomata between the endothelial cells. These openings according to Miller, are artifacts and not natural preformed openings. The blood supply of the visceral pleura is derived from the bronchial artery. In the normal lung lymphoid tissue is found at the distal end of the ductuli alveolares where the bronchi or bronchioli divide and where branches of the pulmonary vein arise from the pleura.

"Anatomically tubercles may be situated in the submesothelial layer or in the areolar layer." Tubercles in the submesothelial layer are usually derived from an infection from without such as pleuritic effusion or phagocytes; tubercles in the areolar layer occur much more frequently and are asso-



Figure 111. Illustrating the McNeill tilting position for the diagnosis of median interlobar pleurisy. This position turns the edge of the septum horizontal to the x-ray target and is invaluable for demonstrating small effusions between the lobes, particularly on the right.

ciated with lymph vessels rather than with blood vessels.

"Tuberculosis of the pleura is rarely a primary infection and is invariably dependent on a tuberculous process in the lung or lymphnodes at the hilum."

In a consideration of interlobar pleurisy it appears as if the infection extends from the hilum nodes to the adjacent pleura. We usually classify pleurisy as to their anatomical location, as diaphragmatic, interlobar and mediastinal.

Interlobar is further classified by Richter,<sup>5</sup> as (1) Median interlobar pleurisy (right side) in exudates between the upper and middle lobe. (2) Superior interlobar pleurisy (right side) in exudates between the posterior and the upper lobe. (3) Inferior interlobar pleurisy (right side) in exudates between the posterior and the lower lobe. On the left side he divides the interlobar septum at the level of the fourth rib and designates an interlobar effusion above this point as superior and below as inferior interlobar effusion. Since most of my recorded observations have dealt almost exclusively with right sided median interlobar pleurisy with effusion, I will confine by remarks to this location.

The physical signs in this condition are usually meager, the chief complaint is a deep seated bronchitis that fails to clear with the ordinary remedies. The physical examination shows no definite impairment on percussion and no distinctive auscultatory findings. There is usually a deep seated, bilateral, bronchial cough and a few rales in the right base at the angle of the scapula. When rales are absent, the loose, bronchial cough may be slightly more exaggerated on the right side. As the condition progresses from the mediastinum to the parenchyma, a few, fine, inspiratory, pleural rales may later be observed in the anterior axillary line,

\*Read before the Louisville Medico-Chirurgial Society.

fourth interspace. In the more severe cases bubbling rales and rhonchi may be heard throughout both bases, but these are usually more marked on the right side.

The seven cases embodied in this discussion were free of any constitutional symptoms. Temperature and pulse were within normal limits and the patients were apparently well, their chief complaint being a chronic and persistent, deep seated cough. There is nothing on physical examination whereby one can diagnose the usual interlobar pleurisy with effusion. Whenever an individual complains of severe bronchitis with the bronchitis seemingly predominating in the right base, one should suspect this condition and especially so in children. A moderately large effusion in the interlobar septum will naturally give signs of its presence by impaired resonance, and diminution of breath sounds with fine, pleural rales corresponding to the interlobar septum. The chief reliance for a diagnosis is fluoroscopic observation. Whenever these conditions are looked at in the usual antero posterior position, nothing characteristic is observed other than a hazy infiltration along the bronchi which is characteristic of a definite pneumonitis. It is interesting to note that whenever the fluoroscope is moved rapidly across the field, unusual shadows appear on the screen due to the angle at which the rays enter the chest.

Barjon<sup>6</sup> calls special attention to the diagnosis of interlobar pleurisy by fluoroscopy and states specifically that when examining the interlobar septa, "in the dorsal position the tube should be raised to the height of the head, and in the frontal position it should be lowered to the level of the pelvis. In this way the normal rays penetrate the inter lobe in its greatest thickness, and the best conditions are found for obtaining an image." The lateral view as it is frequently resorted to in these affections is only useful where the interlobar effusion is larger than usual. Under these circumstances an oblong shadow may be observed through the cardiac density running obliquely from the root downward and outward. Naturally small effusions cannot be observed in this position. One of the distinct contributions to the diagnosis of interlobar pleurisy with effusion is that developed by Dr. Clyde McNeill of Louisville and which for convenience, I speak of as the McNeill tilting position. Dr. McNeill has shown that whenever the patient bends backwards tending toward an extreme lordosis, the back being to the plate and the patient facing the tube, it brings the interlobar septa horizontal to the rays leaving the tube, and throws on the screen a triangular density with its base toward the hilum, and its apex

in the mid lung fields. This shadow varies with the amount of fluid and the position of the patient, and is really better observed with fluoroscopy than with the roentgenogram.

The cases herewith reported are undoubtedly serous effusions and tuberculous in origin, the infection probably extending from the tracheo bronchial lymphnodes by way of the mediastinal pleura to the interlobar fissure.

The tuberculin tests in these cases gave positive reactions in four and negative in one. Two were not tested. The condition is somewhat chronic. Small effusions have a tendency to clear in a few weeks to a few months whereas some have persisted for three to four months. The following case reports indicate its chronicity and the liability to mistake the lesion for a more serious pulmonary affection.

H. U., age 15, referred with a diagnosis of suspected basal tuberculosis, March 14, 1931. Fluoroscopy revealed the true nature of the lesion. A small effusion was still perceptible three and a half months after the first observation although his bronchitis had entirely cleared. Temperature was normal on all occasions, tuberculin test was a weak positive on .1 milligram.

Miss B. D., No. 52,727, age: 33. Physical signs were those of a bilateral bronchitis, temperature normal, tuberculin test 12 millimeters on one-tenth milligram. Fluoroscopy demonstrated a medium interlobar pleurisy with effusion that has persisted for three months with cough and slight mucoid expectoration that has been negative for tubercle bacilli.

G. D., No. 52,341, age: 16. Diagnosed as pneumonitis, right base. There was a loose bilateral, bronchial cough with no adventitious sounds. Temperature 99.8. Tuberculin test on one-tenth milligram strongly positive, being thirty millimeters in diameter. Re-examination August 20, 1931 shows the bronchitis to be practically cleared although there is a residual thickening of the interlobar septum with probably a small amount of fluid present.

W. A., No. 50,727, male, white, age: 14. Under observation of the dispensary since 1927 and diagnosed as positive for a childhood, tuberculous infection. Tuberculin test negative on one-tenth and one milligram of tuberculin. Patient reported to the clinic May 7, 1931 with a deep seated bronchitis. There were bronchial rales and rhonchi scattered throughout both bases, more marked at the inferior angle of the left scapula. The x-ray in A. P. position shows a definite pneumonitis in the right base. Re-x-ray six months later shows a definite, median inter-



lobar pleurisy with effusion. On physical examination there was a loose, bilateral, bronchial cough with bronchial rales and rhonchi throughout both bases posteriorly. The temperature and pulse were normal.

D. B., female, white age 9, No. 54,996: The temperature and pulse were normal. The tuberculin test was strongly positive; the physical signs were those of a loose, bilateral, bronchial cough with a few rhonchi in the right base and a few deep seated, inspiratory rales and rhonchi in the right second interspace. The A. P. view showed an inflammatory exudate in the right root region in 1928. The McNeill position in November, 1931 shows after an attack of bronchitis a definite fan shaped thickening of the median interlobar septum which represents a previous interlobar pleurisy with effusion.

F. F., No. 48,893, female, white, age: 34. Tuberculin test was not given. The physical examination at the onset and termination of the pleurisy was essentially negative. The patient was not examined when the density was at its maximum. On two occasions temperature was 99.2 and 99.4. The films show an interlobar pleurisy that extends to the midaxillary line and is observable in the lateral position, but is best seen in the McNeill position.

Mrs. N. O., No. 41,470, female, white age: 31. The physical signs were those of bronchitis. Temperature and pulse normal. X-ray in the A. P. view shows an inflammatory exudate in the right root at the base and extending outward into the lung field which is suggestive of an interlobar pleurisy. Since this was suspected of being interlobar pleurisy, the patient was called back for fluoroscopic examination August 1931, and the McNeill position on this occasion was negative. The base of the lung was clear indicating that the process had absorbed.

The treatment for this condition is basically that of tuberculosis and incidental treatment for the associated bronchitis. Even in the absence of fever, bed rest should be enjoined and a full nutritious diet administered. In the way of medication we have found small doses of the iodides particularly beneficial especially Tincture of Iodine, U. S. P. drops five, three times daily one hour before meals. For children this is used half strength. Cod Liver Oil is invariably indicated and is to be recommended.

After the bronchitis and pneumonitis has apparently cleared as demonstrated by physical and roentgenological examination, one may elect to continue bed rest for six to eight weeks or until the effusion is undergoing retrogression. The child may be permitted to return to school before complete absorption takes place providing he can be

kept under strict observation. We must recognize this condition is primarily tuberculous and that it is much more common than we have been led to believe.

The McNeill position is invaluable for detecting these small effusions in the right interlobar fissures and should be used routinely. So far, I have not recognized any interlobar pleurisy with effusion on the left side. This may be due to the anatomical position of the septum which makes a sharper descent on the left than on the right. The accumulation of fluid is favored on the right side by the shelflike position of the median septa.

#### CONCLUSIONS

Interlobar pleurisy with effusion is a relatively common affection and should always be suspected in the presence of a deep seated bronchitis.

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#### DISCUSSION

**J. Rowan Morrison:** I have thoroughly enjoyed this paper as I do all of Dr. Miller's essays. He has demonstrated pretty conclusively that we can not tell all about the chest from the antero-posterior position. When Dr. McNeill showed me some of his early pictures taken in the tilted position I was surprised to see how it brought out things that could not possibly have been detected from the antero-posterior position.

**Clyde McNeill:** First I want to express my appreciation to Dr. Miller and the Society for the opportunity to meet with you tonight and to hear this instructive paper.

Dr. Miller has asked me to make a few remarks on the technique of demonstrating interlobar lesions, and to show several films illustrating the various positions. Nearly three years ago we abandoned stereoscopic films of the chest as a routine in favor of anteroposterior and lateral films. During the last two years we have been using the tilted chest position to demonstrate lesions in the pleura between the middle and lower lobes on the right, and between the upper and lower lobes on the left. The details of this position are being published elsewhere. Suffice it to say that the patient stands in front of a plate-changer and bends backward at an angle of 45 degrees so as to make the interlobar pleura perpendicular to the plate. The film that I will show you was the first one that we made in this position.

In the anteroposterior view you will notice a lesion that resembles a patch of bronchopneumonia. The edges are hazy and the area of apparent consolidation merges into the surrounding tissues without a sharp line of demarcation. In the tilted position this rounded shadow with distinct edges is transformed into a triangular shadow with edges as sharp as if cut with a knife. No one could fail to make a diagnosis of an interlobar effusion.

As I understand it, the patients described by Dr. Miller are not acutely sick, and most of these lesions are probably tuberculous pleurisy with effusion. Our first case was a simple effusion associated with cardiac failure in rheumatic heart disease. Our second case was interlobar empyema. In the anteroposterior view interlobar empyema is very commonly called bronchopneumonia or unresolved pneumonia.

**Morris Flexner:** Dr. Miller's paper is both instructive and interesting, but there are one or two things not quite clear to me; first, what percentage of these cases are tuberculous; second, do these patients show any variation in the blood count? Practically all of them, I believe are afebrile.

Undoubtedly many of these cases have been mis-diagnosed in the past; we have all seen them and called them unresolved or chronic pneumonias, and I am glad that Dr. Miller has apparently found a way in which such error can be avoided in the future. McNeill posture is also a real addition.

**Louis Frank:** I wish to thank Dr. Miller, and also Dr. McNeill, for one of the most instructive papers I have listened to in a long time. This position is undoubtedly of great value as an aid to diagnostic accuracy, but the point of chief interest to the surgeon is the possibility of accurately locating pockets of fluid which in many cases cannot be satisfactorily done in the anteroposterior position. Here the tilted chest position will unquestionably save time and not infrequently the necessity for two or more operations before we can definitely locate and aspirate the collection of fluid.

**J. W. Moore:** I have enjoyed the paper very much indeed and will be glad to hear Dr. Miller answer the questions asked by Dr. Flexner.

I would like to ask if the bedside unit can be used for the lateral position Dr. McNeill speaks of?

**Clyde McNeill:** Yes, sir.

**J. W. Moore:** That is most important. It would appear to be hardly necessary to make an antero-posterior picture in view of the information we are almost certain to obtain from the lateral position, not only in tuberculous conditions but also in cardio-vascular diseases.

I feel greatly indebted to Dr. Miller and Dr. McNeill for their instructive exposition of this subject.

**J. Garland Sherrill:** I have enjoyed Dr. Mil-

ler's excellent paper very much and wish to thank him and Dr. McNeill for illustrating this excellent technique. I think Dr. McNeill is too modest in disclaiming credit for originating it. Some years ago I had the pleasure of seeing a case in which he had made the x-ray examination and demonstrated very clearly a small localized collection of fluid in the cavity of the lung. It showed not only the size of the abscess cavity but the amount of fluid present.

Papers of this kind do us much good, showing the constant improvement that is being made in x-ray technique and enabling us to make a larger use of its possibilities.

One very valuable feature of Dr. McNeill's technique is that it offers a means of diagnosing early pneumonia. On several occasions I have been saved the embarrassment of operating for appendicitis by the timely diagnosis of pneumonia which was later confirmed by x-ray examination. I believe this method will often enable us to make an accurate diagnosis earlier and serve to clarify many more or less obscure conditions in the chest; for instance, in cases, such as I have seen, where x-ray shows a shadow that we take to be an aneurism, and yet we cannot get the pulsations, but upon post-mortem we find that an aneurism really existed. This method should be of great aid in such cases.

A question that arises in the treatment of these cases, especially where they are afebrile, is whether it is wise to tap them or let them alone. The positive location of the collection of fluid by Dr. McNeill's method will in many cases save both the surgeon and the patient the embarrassment of tapping without finding it.

Chest surgery is still in its infancy and there is always the question how best to handle this type of cases; whether to tap and wait to see what happens or to go into the chest and break up the adhesions between the two layers of the pleura. In cases where there are tuberculous lesions between the two layers of the pleura, I believe it is best to collapse the lung and allow Nature to take its course.

**E. R. Gernert:** I wish to express my appreciation for being invited here tonight to hear Dr. Miller's paper, which, as usual, when he presents a subject, leaves very little to be said, and I can only emphasize some of the points he brought out.

These conditions are not nearly so rare as we formerly believed. Many cases x-rayed in the antero-posterior position have been mis-diagnosed as pneumonitis or bronchitis and are later demonstrated to be intralobar pleurisy.

Physical examination offers very little as an aid to the diagnosis. Probably the outstanding finding is a bronchitis, which may be slight or marked. Otherwise the physical findings are practically negative.

The clinical history often simulates the symptoms of tuberculosis; the patient's complaining



of cough, some have slight loss of weight and, almost without exception, they complain of fatigue. While most cases are afebrile some of them run a slight degree of temperature, the highest on our records being 99.8° F.; usually from 99° to 99.4°.

As to treatment, such cases are usually put to bed for four to six weeks, even in the absence of temperature. If they make good progress it is all right to let them return to school, but they are still required to take a rest period of two hours every afternoon, and take cod liver oil and tincture of iodine. The dose of iodine being about five minims one or one and one-half hours before meals, well diluted.

In view of the facts presented here tonight, I think it behooves us all, in cases of bronchitis where we can find nothing in the upper respiratory tract to account for it, to x-ray the patient in the McNeill position to ascertain whether or not we have to deal with an intra-lobar pleurisy.

**Clyde McNeill**, (in closing): It seems that I did not make myself quite clear about the two positions. The tilted chest position is comparatively unknown, but the lateral position has been used for along time. I remember that we were using it in Berlin in 1923 in studying annular shadows. If a shadow was annular in both the anteroposterior and lateral views, we assumed that the lesion was spherical and therefore a real cavity.

**O. O. Miller**, (in closing): I wish to thank the gentlemen for their liberal discussion and commendatory remarks. Not only is Dr. McNeill deserving of credit for having originated the tilted chest position, but he was the first man in Louisville to emphasize the value of the lateral x-ray in routine chest work. He has made a real contribution to medicine and I wish to take this opportunity of expressing my appreciation.

Dr. Flexner asked me what percentage of these cases are tuberculous. I cannot satisfactorily answer that question. Five of these patients showed positive tuberculin tests, but that does not necessarily indicate the presence of tuberculosis. However, where it occurs so uniformly and the fluid persists over a long period of time, we can hardly explain it on any other basis. I am willing to admit, however, that a severe bronchitis may produce interlobar effusion. Some writers speak of it as Peri-incisuritis.

In a chest clinic, where we see from twenty to thirty patients in a single morning, it is almost impossible for us to do anything more than routine physical examination and fluoroscopy. In a comparatively few especially interesting cases, some of the students may make a blood count for us.

Regarding Dr. Frank's discussion, I believe that in intra-lobar empyemas the use of this position would make it easy to locate the abscess

and, under those circumstances, the thing to do is to aspirate. Many cases are on record in the literature that have been aspirated repeatedly, and there appears to be no tendency in these cases for the infection to follow the track of the needle into the lung.

I wish to thank Dr. Gernert for his discussion. The point he brought out in regard to the afternoon rest period is very important.

In conclusion, I believe that if in the presence of a severe bronchitis, we will routinely fluoroscope these children in the McNeill position, we will be amazed at the number of cases in which we will detect fluid in the interlobar fissure.

## FORUM

To the Editor:

I am still in Princeton. Haven't been able to get out of this city since September 16, 1931. I am improving slowly, but shall not be able to go back to Eddyville and resume my practice before about April. I will delegate one of the other doctors to hold an election and collect the dues to the State Medical.

You speak of the great importance of the American Medical Association. We country doctors, general practitioners, don't think the American Association is of much benefit to us. We believe it does us more harm than good. The American Association, the medical colleges and the city doctors are combined to crush the country doctors out of existence. Very few country boys will ever be able to study medicine under the standard set by the A. M. A., the medical colleges and the city doctors. The country is powerless to do anything under the present curriculum. Every councilman, every delegate and everything else is bound by this cruel monopoly to crush the country and build up the cities and larger towns. All the delegates to all the conventions are from the cities and larger towns, largely from the medical colleges—teachers in the universities and colleges.

They are men that don't realize the condition of the country; and there are thousands in the country districts suffering and dying for want of medical attention.

You speak of chiropractors. We think any community would be better off to have chiropractors than no doctor at all.

It is stated that thirty-two counties in the State have no doctors at all. Parts of Lyon, Livingston and Trigg Counties can't get a doctor now, and in a few years many more districts will be so they can't get medical aid. Thousands of people are suffering and dying without the attention of medical aid.

Yes, I have read the able article of Dr. V. E. Simpson. Dr. Simpson is an able man, an honorable, wise, doctor, one for whom I have the greatest respect, but Dr. Simpson don't know anything about conditions in the country any more than Braddock knew about fighting In-

dians, and he misses the mark as badly as Brad-dock did in his famous battle with the Indians.

Once there was a queen that was admonished that a great many of her subjects needed help, needed bread. She replied, "If they have no bread let them eat cake." Such a silly reply!

So the A. M. A., the city doctors and the professors in the medical colleges say to the country people, "Build highways and good roads and hospitals, and we will furnish you all the doctors you need." Don't we all know it would take from fifty to a hundred years to accomplish all this?

Jefferson County and Louisville were all country at one time, and it took at least a hundred years to develop Jefferson County. No, we country doctors don't believe there is any way to remedy the great suffering in the sparsely settled districts but by a graduated standard in the requirements to practice medicine.

A high school diploma, four years in medical college and one year interne, diploma as general practitioners. Let him practice five years as a general practitioner; then, if he desires, let him take post-graduate work until he is thoroughly qualified for his specialty.

This will give the country boys a chance to make doctors and it will produce better and more competent specialists.

Yours very truly,

W. G. KINSOLVING, M. D.

### BOOK REVIEW

**SURGICAL ERRORS AND SAFEGUARDS.** By Max Thorek, M. D., Surgeon-in-Chief, the American Hospital, Chicago; attending Surgeon, Cook County Hospital; Corresponding Member, Societe des Chirurgiens de Paris, France; Associate, Royal Academy of Medicine, Torino, Italy; Honorary Corresponding Member, Egyptian Medical Association, Etc. With a foreword by Arthur Dean Bevan, M. D., Professor and Head of the Department of Surgery, Rush Medical College of the University of Chicago.

J. B. Lippencott Company, Publishers, Philadelphia, Montreal, London.

It is a duty incumbent upon those who have had considerable experience and have, themselves, passed through the painful ordeal of learning what is erroneous and dangerous in surgery, to record and pass on such acquired knowledge for the benefit of the inexperienced. While it is human to err, it is inhuman not to try, if possible, to protect those who entrust their lives into our hands from avoidable failures and danger.

The author in this valuable volume gives his personal experience of over twenty-five years in the practice and clinical teaching of general surgery justifies him in acting with-

out presumption or vanity, as a mentor to those who are entering on the perilous paths of surgical practice which he has trodden. Indeed, it is because of his own mistakes and the dangers which he himself has met that the author is filled with the keen desire to impress their possibility on others, so that they may benefit from his failures and disappointments.

Although many of the matters included in this volume have been gathered from the experience of others, as recorded in their writings and from constant scientific intercourse with some of the world's greatest contemporary surgeons, the chief contributions are the author's personal experience—things which he has actually lived through.

Although the era of the furor operandi has passed, one still has almost daily evidence of the disastrous effects of major surgical procedures, attempted lightly by young, or even inexperienced older surgeons. The author would in no way dampen the ardor of the neophyte, or check his ambition to acquire skill. Still, it is well to suppress the feelings of cocksureness and egoistic pride (to which the writer, unfortunately, was no stranger), which impel the novitiates to undertake risks they know not of, and which often lead to disastrous results.

**BIOCHEMISTRY IN INTERNAL MEDICINE.** By Max Trumper, Ph. D., Clinical Chemist and Toxicologist; formerly in charge of the Laboratories of Biochemistry of the Jefferson Medical College and Hospital and of the Psycho-Biochemistry Laboratory, Graduate School of Medicine, University of Pennsylvania, Philadelphia, and Abraham Cantarow, M. D., Instructor in Medicine, Jefferson Medical College, Assistant Attending Physician, Philadelphia General Hospital; in charge of Laboratory of Biochemistry, Jefferson Hospital. With a foreword by Elmer H. Funk, M. D., Sutherland M. Prevost Professor of Therapeutics at Jefferson Medical College. 454 pages with illustrations. Philadelphia and London: W. B. Saunders Company, 1932. Cloth, \$5.50 net.

The advancement of our knowledge of biochemical changes in health and in disease has been most rapid, and many of the conceptions of a few years ago have been completely changed or modified. This book will serve to acquaint the practitioner with the recent advances, many of which are to be found only in special monographs and text books. It will serve as a useful companion volume worthy of position among those other texts which constitute the working library of the medical student and especially the busy practitioner.



# Kentucky Medical Journal

Published Monthly By

THE KENTUCKY MEDICAL ASSOCIATION  
IncorporatedEntered as second class matter October 22, 1906, at  
the Postoffice at Bowling Green, Ky., under act of  
Congress, March 3, 1879.Subscription Price .....\$5.00  
Edited Under Supervision of the CouncilOFFICERS OF THE KENTUCKY STATE MEDICAL  
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NEXT MEETING LOUISVILLE  
OCTOBER 3, 4, 5, 6, 1932

## COUNTY SOCIETY REPORTS

**Jefferson:** The May program of the Jefferson County Medical Society will be as follows:

### May 2nd—Case Reports

Retropharyngeal Abscess in a Child, with Autopsy Findings, Armand Cohen, M. D., Claude T. Wolfe, M. D., O. O. Miller, M. D. and A. J. Miller, M. D.

(Title to be announced), H. C. Noland, M. D.

### Essay

Non-Parasitic Abscess of the Liver, with Report of Cases, J. Duffy Hancock, M. D.

### May 16th

Address (Title to be announced), Walter C. Alvarez of the Mayo Clinic.

GUY AUD, President,

ULY H. SMITH, Secretary.

**Franklin** The Franklin County Medical Society met in regular monthly session in the Writing Room of the Capital Hotel at 12 o'clock noon, on April 7, 1932.

The meeting was called to order by the president, Dr. Heilman. Members present: Drs. Ginn, Snyder, Patterson, Griffey, Coblin, Jackson, Coleman, Heilman, Minish and Travis.

Dr. N. B. Smith, D. D. S., guest speaker, spoke on "Co-operation between the Dentists and Doctors of Medicine." Dr. Smith's talk was instructive and enjoyed by all present. A free discussion followed. The members adjourned to the Dining Room for lunch.

C. E. YOUMANS, Secretary.

**Bourbon:** The Bourbon County Medical Society met on Thursday evening, March 17th at 7:30 o'clock this being the regular monthly meeting date. The meeting was held in the County Court Room of the Court House, Paris, Kentucky.

The following members were present: Drs. C. G. Daugherty, J. A. Orr, P. L. McClure, R. M. Blemaker, W. B. Hopkins, B. N. Pittinger and M. J. Stern.

Visitors: Drs. D. B. Harding, C. L. Barrett and Scott Breckinridge, Lexington; Russell Kenney, Robert Hall and Carey Kenney, Paris.

Dr. D. B. Harding, Lexington, read a paper on "Cholecystography" illustrated with numerous lantern slides, showing normal and abnormal gall bladder shadows.

The discussion was opened by Dr. C. G. Daugherty, followed by Dr. Stern and Dr. Orr. The discussion was closed by Dr. Harding.

Montion picture of Spinal Anesthesia was presented. Meeting adjourned.

MILTON J. STERN, Secretary.

**Grant:** The Grant County Medical Society met at the office of the Health Department, Wednesday evening, March 16, 1932 at 7:30 o'clock with the following members present:

Drs. A. D. Blaine, J. D. George, J. W. Abernathy, C. D. O'Hara, N. H. Ellis, C. M. Eckler, J. T. Stephenson, D. D. S., and C. A. Eckler with Dr. J. W. Abernathy in the chair. There being no business of importance and after reading the minutes of last meeting, we entered into the subject of Case Reports since our last meeting.

Dr. A. D. Blaine reported a case of Influenza in a young boy running an axillary temperature of 106 degrees, probably of intestinal origin.

An interesting case in Obstetrics was reported by Dr. J. D. George which was quite out of the ordinary and not experienced by many in the society. Dr. George also reported a bad case of Urticaria (Hives) cured promptly by hypodermic dose of Adrenalin. He also reported a case of Rheumatism with a Prodromal Exanthema resembling Measles long before the involvements of the joints.

At this time our society learned of the illness of our brother doctor, R. E. Limerick, who is confined to his home with Influenza, and the society extended him their profound sympathy and instructed the secretary to write him expressing their wish for a speedy recovery.

The subject for the evening, "Influenza and It's Complications" In the absence of Dr. J. L. Price, who was to open the discussion, was opened by Dr. C. M. Eckler. He enumerated various types and phases of this dreaded disease, such as Ear Complications, Sinus Trouble, but has had no complications, as yet, of Pneumonia. He cites the use of Mulford's Serum, used as a preventative in 15 cases of telephone men and none have contracted the disease as yet, he stressed the point of warning a patient of secondary temperature that occurs after the first temperature has left. He urges that all cases of temperature rest in bed. He believes Influenza, in itself, is harmless, but paves the way for something else.

Dr. Ellis believes in taking care of yourself during convalescence and stresses the use of castor oil in Influenza. He reports numerous cases of relapses, as most frequent in this disease.

Dr. Abernathy has had many cases of the Intestinal type in this season, has had one woman, aged 50 years, to die of abscess of the liver following Influenza. The doctor stated he sees more cases of Appendicitis empyema following an epidemic of the flu than at any other time.

Talks were made on personal experience and different treatments discussed until quite a late hour, and each one felt that he had profited by attending this meeting.

Subject for next meeting, "Rheumatism." Discussion opened by Dr. C. M. Eckler.

C. A. ECKLER, Secretary.

**Mason:** The regular meeting of the Mason County Medical Society was held at the Hays-

wood Hospital on Wednesday evening, February 10th, 1932. Dr. L. H. Long, presiding. The following doctors were present: Hord, Stark, Phillips, Carrigan, Morgan, Quigley, Patton, Long and Murphy. Dr. and Mrs. Grame Mitchell of Cincinnati, were guests of the Society. The minutes of the January meeting were read and approved. Drs. Carrigan and Stark were admitted to the Society, according to Chapter 1, Section III of the By-laws, Dr. Stark being admitted from Harlan County Society and Dr. Carrigan from Ohio. There were no clinical cases to be brought before the Society.

Dr. A. Grame Mitchell, gave an excellent lecture on "Nutrition." The following notes were taken from his lecture: 'A food for an individual must not only be chemically balanced but be psychologically right.' He illustrated the correct food for an individual with the following chart: Sufficient energy, Sufficient and correct protein, Correct mineral balance, Accessory substance,—vitamins, Sufficient fluid content, Digestibility.

Dr. Mitchell went into detail to explain each one of these necessities. He reminded us that there were many different baby foods on the market and that many foods were made up in the home, that some had added alkalis, others had added acids, and yet the average well baby was able to tolerate, digest and gain weight on most any of them. He called our attention to the fact that to get sufficient energy, some foods contained high fat, others carbohydrates, but that the baby was smart enough to get its sufficient energy from either. In regards to the protein content of a food, it was generally conceded that four grams to the pound were necessary in the first year of life, and at least 15% protein. Older children or adults should have 2-3 of this as animal protein and 1-3 vegetable. It is generally considered that adults need 1-2 gram of protein for each kilogram of body weight.

The accessory substances on his chart referred to the necessary vitamins. Dr. Mitchell said we all knew that the vitamin theory had been over exploited, but nearly every baby is now getting cod liver oil and orange juice, that whereas you used to see many cases of scurvy, you seldom see more than one or two cases in a year's time. Dr. Mitchell states that the average infant needs 2½ ounces of food for every pound of body weight per day.

At this point, Dr. Mitchell gave a definition of "Nutrition" which he said was merely a summary of all he had said before. In closing he urged us not to forget that a baby needs iron at 10 months, an egg at one year, and meat at 18 months. His lecture was discussed by practically every one present, and many expressed the thought that his lecture was like a post graduate course. Meeting adjourned.

ALLEN F. MURPHY, Secretary.  
L. H. LONG, President.



# KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. 30 No. 6

BOWLING GREEN, KY.,

JUNE, 1932

## A KEY TO THE WHITE HOUSE CONFERENCE

The publications of the White House Conference on Child Health and Protection, when complete, will represent the most comprehensive library of childhood which has yet been assembled. More than half of the total forty volumes are now off the press. Each new book appearing sets in motion again the ever-widening circle of interest in the Conference findings.

The reports in the volumes now available are serving as guides for workers in many specialized fields of child welfare. One volume, however, White House Conference 1930, tells the whole story of the Conference briefly and in a very readable fashion, and is finding its way onto book shelves in private homes as well as into the reference libraries of leaders of civic and social groups.

White House Conference, 1930 contains the significant leading speeches of the Conference, including those of President Hoover and Ray Lyman Wilbur, M. D., the Chairman, together with abstracts of the reports of all the Conference Committees, and the Committees' recommendations.

As a large edition of the book was published, it has been possible to make an attractive board edition available at 50c, including postage. There is also a cloth edition at \$2.00. The book may be obtained through the Conference office, Interior Building, Washington, D. C.

Every physician in Kentucky should have this book upon his desk and in his waiting room for his patients.

## THE PRELIMINARY PROGRAM

Elsewhere in this issue of the Journal will be found the preliminary program for the 82nd Annual Meeting of the Kentucky State Medical Association, which will be held in the Roof Garden of the Brown Hotel, Louisville, October 3rd-6th. This program is, of course, subject to change and modification, one or both. Readers of the JOURNAL will be kept informed, through these columns, of such changes or modifications as may occur.

In view of the acute economic depression presently obtaining, it has been deemed wise to dispense with all social features. The en-

tire three-day period will be devoted wholly to scientific discussions.

The guest speakers have been selected with great care and are nationally known. Practically all the exhibit space has been filled. Members of the medical profession in Louisville, almost without exception, are earnestly cooperating with the Committee on Arrangements in efforts to make the coming meeting one of the best, if not the best, every held by the Association.

Physicians throughout the State may begin planning to attend with every assurance that the time consumed could not be more profitably spent.

## COUNTY SOCIETY MEETINGS

It is gratifying to note that, with the opening of Spring, many of the county societies are having splendid meetings. One such, held at Stearns, McCreary County, May 2nd, is described in the sub-joined letter to the Editor of the JOURNAL by a visiting Louisville physician, Dr. G. G. Altman. At these meetings, members of the Jefferson County Medical Society seem to be in demand as speakers, which is a good thing alike for the visiting physicians and the physicians resident in the counties visited. Probably, each can learn something from the other.

Dr. Altman's letter follows:  
To the Editor:

I wish to express my sincere gratitude to you and Dr. R. M. Smith, the secretary, for the opportunity of speaking before the McCreary County Society at Stearns on May 2nd. Even though it was a long trip, and times are hard, and money for gasoline is scarce, we never bought twenty gallons of gasoline with greater pleasure.

Our President-Elect, Dr. Philip F. Barbour; Dr. R. Hayes Davis and myself made the trip, reaching Stearns at 6:15 P. M. Some forty-two physicians from Somerset, Monticello, Danville and surrounding territory, up and down the Cumberland River, had already assembled there. In addition, several public health nurses, many doctors' wives and daughters and county officials, and many prominent laymen were present.

After a wonderful dinner of fried chicken, hot bisenits and a fruit salad that was really a salad, the meeting was called to order by Vice-President A. Bradley, and lasted from

8:00 o'clock until 11:00 o'clock.

Dr. Barbour and Dr. Davis both had fine papers, dealing with practical every-day subjects. Each was well received and widely discussed. My own effort, the final on the program, seemingly met with a cordial reception. I tried to make it practical and helpful, as well as simple, so that the truths contained there in might be understood and made use of in the every-day work confronting the physicians in their goings to and fro over the hills and through the valleys.

All in all, particularly from the standpoint of enthusiasm and interest, I believe it was the best meeting of its kind I have ever attended in Kentucky.

Mr. Butler, General Manager of the Stearns Lumber and Coal Company, and Mr. Bob Stearns, the son of the owner, extended a splendid welcome and a generous hospitality, going to great length to make everybody feel at home.

We started on the return journey at 11:00 P. M. and got back to Louisville at 4:00 o'clock in the morning. As I look back on the meeting, now after not too much sleep, I repeat what I began with, that I am grateful for the opportunity which you provided me of meeting the fellows in the McCreary section and of participating in the program.

### COURSES IN PUBLIC HEALTH

Through the co-operation of the State Board of Health and the State Health Officer, Dr. A. T. McCormack, the University of Kentucky is offering special courses in Public Health during the first of the Summer Session this year—June 14 to July 16.

These courses are designed, not only to meet the particular needs of the health workers and workers in related fields, but also to disseminate knowledge relative to health generally to university students and others. They include: Personal and Community Health, Public Health, Maternal and Child Health, Health Education and Health Supervision of Schools, Tuberculosis and Tuberculosis Control, Public Health Nursing, Epidemiology and Communicable Diseases and Public Health Administration.

Resident members of the University Faculty, who will direct these courses, are: J. S. Chambers, M. D., Professor of Health; O. H. Pinney, M. D., Professor of Health; W. A. Heinz, M. A., Assistant Professor of Health; W. A. Freeman, M. D., Professor of Health Administration at Johns Hopkins University, School of Hygiene and Preventive Medicine, and Edward J. Murray, M. D., Director, Julius Marks Sanitorium, Lexington,

constitute the non-resident members of the Faculty.

The course in Epidemiology and Communicable Diseases is for health officers only, as is also the course in Public Health Administration. Both these courses will be under the direction of Professor Freeman.

Public Health Nursing embraces a general course covering the principles and practice of public health nursing and is for nurses only. This course will be under the joint direction of Margaret L. East, R. N., Director, Bureau of Public Health Nursing, State Board of Health, and of Virginia Martin, R. N., Public Health Center, Lexington.

The course in Health Education and Health Supervision of Schools is a general course covering health work in the public schools. It is intended for health officers, nurses and teachers. This course will be under the direction of Professor Chambers.

The M. D. degree is required for admission to the courses given for health officers. Courses for other health workers are open to any one qualified to pursue them.

Special lecturers include Arthur T. McCormack, M. D., State Health Officer; P. E. Blackerby, M. D., Assistant State Health Officer and the following members of the Administrative Staff of the State Board of Health: J. L. Jones, M. D.; Jethra Hancock, M. D.; Annie S. Veech, M. D.; L. E. Smith, M. D.; L. H. South, M. D.; F. C. Dugan, O. E.; Sarah Vance Dugan, M. S., and John W. Kelly.

Detailed information in regard to any or all of these courses may be obtained by addressing the Director of Summer Session, University of Kentucky, Lexington.

### THE POST GRADUATE COURSE

Final arrangements have been completed for the post graduate course, which will be held in Louisville at the City Hospital, beginning Monday, June 6.

The program has been mailed to every physician in Kentucky and the committee under the chairmanship of Dr. C. W. Hibbitt, has endeavored to make this course of practical value and has selected subjects for discussion that confront the physician and surgeon in every day practice. The science and art of medicine is constantly changing and the doctor who does not attend his county society meetings and visits a school of instruction at least once a year, revolves in his own little whirlpool while the great current of progress flows on by wider shores. A good physician is a solace and blessing to a community and a poor one, a menace.

The registration fee is only \$2.00, which is within the limits of the most depressed purse.



THE KENTUCKY STATE MEDICAL  
ASSOCIATION SUMMER POST  
GRADUATE COURSE

GENERAL PROGRAM  
City Hospital—Louisville  
June 6-18, 1932

The following out-of-town graduates of University of Louisville School of Medicine, who are also connected with the City Hospital, will address visitors and the local profession Monday, June 6th, beginning at 9:00 A. M.

David Polowe, M. D., Paterson, N. J.—The Specific Gravity of the Blood in Pregnancy and in the Puerperium. Lantern Slides.

Jack Henry, M. D., University of Tennessee, Memphis, Tenn.—Allergy: In Theory and Practice.

A. V. Griswold, M. D., Cleveland, O.—The Surgical Treatment of Adhesive Pericarditis.

Lantern Slides.

C. N. Kavanaugh, M. D., Lexington—Tularemia with Report of 120 Cases. Lantern Slides.

M. G. Seibel, M. D., Washington University, St. Louis, Mo.—Tumors of the Islands of Langerhans and Hypoglycemia. Lantern Slides.

Harry Beckman, M. D., University of Marquette, Milwaukee, Wis.—A Note on the Acid Treatment of Hay Fever. Lantern Slides.

V. V. Anderson, M. D., New York City—Recent Developments in Psychiatry.

Otho C. Hudson, M. D., Brooklyn, N. Y.—Nicola Operation for Recurrent Dislocation of the Shoulder. Lantern Slides.

F. P. Helm, M. D., Miami, Okla.—Treatment of Sporotrichosis. Lantern Slides.

Ermin L. Ray, M. D., New York City—The Roll of the Doctor in Aviation.

REGISTRATION FEE—\$2.00

	Monday June 6th	Tuesday June 7th	Wednesday June 8th	Thursday June 9th	Friday June 10th	Saturday June 11th
8-9	LABORATORY					
9-10			Goitre Wathen	Tubercu- losis Miller	Urology Grant	Modern Treatment of Varicose Veins Out-Pa- tient De- partment Armstrong
10-11	PROGRAM ABOVE	COMMENCEMENT EXERCISES—U. of L.	Gall Bladder E. S. Allen	Pneumonia Symposium (Kinsman (Leavell (Johnson	Gynecology (Price (Lukins (Grigsby	Orthopedics Owen & Woodward
11-12			Peritonitis Sherrill	Empyema W. Frank	Obstetric Symposium	Proctology Asman
12-1			Breast Tumors Abell	Internal Medicine Simpson	Speidel and McConnell	Cancer L. Frank
LUNCH						
2-3		State Board of Health	Eye Pfingst	Skin Young	Prenatal Clinic Pickett and Starr	Diets L. Smith
3-4			Acute Intestinal Obstruction Hendon	X-ray Bell and Herrmann	Ear, Nose and Throat Dean	

	Monday June 13th	Tuesday June 14th	Wednesday June 15th	Thursday June 16th	Friday June 17th	Saturday June 18th	
8-9	LABORATORY						
9-10	Pediatric Wards  Smith & Andrews	Heart Ward Rounds  Moore Frankel	Cystoscopic Demonstra- tion  Stites	Blood Transfusion  Strickler	Urology  Grant	Nerve Surgery  Zimmerman	
10-11	Scarlet Fever Immunity  J. D. Allen	Heart  Horine	TRIP TO WAVERLY HILL SANATORIUM AND DINNER	Gynecology  Hibbitt Davidson Fallis	Orthopedics  Miller and Trawick	Brain Surgery  Spurling & Jelsma	
11-12	Pediatric Clinic  Barbour	Internal Medicine  Simpson		Emergency and Indus- trial Sur- gery  Bloch	Medicine  Dowden	Pathology  Miller	
12-1	Contagious Diseases  Pritchett	Psychiatry  Gardner		Appendi- citis  Aud	Medicine  Flexner	Delivery of Diplomas  Barbour	
LUNCH				LUNCH			
2-3	Infant Feeding  J. Bruce	Eye  Wolfe		Salvarsan  Young & Staff	Sinus Diseases  Bass		
3-4	Anesthesia  Long	Nervous Diseases  Moren		Radium  Keith	Stomach  Lucas		

## DISPENSARY CLINIC

Medicine, Surgery, Pediatrics and Gynecology—Daily: 10-12.

Genito-Urinary—Daily: 2-3.

Prenatal Clinic—Wednesday and Friday: 1-3.



**SCIENTIFIC EDITORIAL****BUT CHILDREN NEED MOTHERS**

"Every child has the right to a mother—living and well."—Alice N. Pickett, M. D.

This slogan has for nearly ten years appeared on the leaflets dealing with maternal health distributed by the Bureau of Maternal and Child Health of the Kentucky State Board of Health. Toward the accomplishment of this goal, the public health agencies, official and non-official, in the medical profession, in organizations and as individuals, and many interested lay groups are making every effort.

It is true that a Kentucky mother has better than ninety-nine chances out of a hundred of living to care for her child, provided of course, that she does not get run over by an automobile or die of one of the diseases to which all of us are subject. But even this small proportion amounts to more than 300 deaths a year of women whom Kentucky needs most, from causes peculiar to motherhood; and that the odds in favor of Kentucky mothers can be made a great deal better than this, no one doubts.

The prevention of maternal deaths is not such a simple matter as the prevention of deaths from smallpox, diphtheria or typhoid fever. It is merely a question of making use of simple preventive procedures that are—or should be—known to all, and that are available to all. But no one thing quite as easy as vaccination will prevent maternal deaths. In fact, in the present state of our knowledge, some maternal deaths cannot be prevented. But others can.

The two most important factors in the prevention of maternal deaths are good doctors and good patients, and getting them together as soon as the baby is known to be on his way. Of course, Kentucky doctors and Kentucky patients are good, and the maternal mortality of Kentucky was in 1927 the second lowest of any State. During the vicissitudes of 1928 and 1929 this good record could not be kept up; the figures for later years are not available. But these preventable deaths remain. And so our Kentucky doctors are striving to make themselves better doctors, and the State Board of Health and other health agencies are teaching the women to be better patients, and to consult their doctors early.

The physicians have shown themselves particularly interested in this problem. In 1926 the State Medical Society and the Louisville Obstetrical Society requested a thorough study of every maternal death, which was done for the years 1927 and 1928; in that same year seventeen special lectures on obstetrics were

given before county and district medical societies, usually two lectures to a group, and were attended by more than 200 physicians; and in the summer of 1931 five-day courses of lectures and demonstrations in obstetrics were given in Glasgow and Hazard by a nationally known authority,—under the auspices of the medical societies of the surrounding counties, and were attended by fifty-three physicians. These three features were financed by the United States Children's Bureau, at the instance of the State Bureau of Maternal and Child Health.

Studies like the one mentioned were later requested by many other states, and undertaken in fourteen of them.

A preliminary report of this study was given to the medical society in 1929. The final report is nearly completed. A total of 663 Kentucky deaths were studied. Some of the findings of most general interest have to do with the 279 deaths from puerperal septicemia (child bed fever) and with the 169 deaths from puerperal albuminuria and convulsions. It has been well known that these two complications, both of which are largely, though not entirely, preventable, caused two-thirds of the maternal deaths. But this study showed that 43 per cent of the deaths from puerperal septicemia followed not childbirth, but early termination of pregnancy, in many cases due to intentional interference by the women themselves. And that of the deaths from albuminuria and convulsions in the latter part of pregnancy or during confinement, about two-thirds were of women who were not seen by a physician until they were already in poor condition, including about three-eighths that were of women who did not see a physician until after they had already had convulsions! Evidently continuing efforts toward teaching Kentucky women to be good patients and toward bringing doctor and patient together, are badly needed.

What should prospective mothers know in order to be good patients?

1. They should place themselves under a competent physician at once.
2. They should know the danger signals that, heeded, may prevent disaster.
3. They should carefully follow the doctor's instructions.
4. They should not rush their doctor against his better judgment into an operation that may be dangerous for mother and child.

FRANCES C. ROTHERT, M. D.

U. S. Children's Bureau.

**OFFICIAL ANNOUNCEMENTS**

PRELIMINARY PROGRAM KENTUCKY STATE  
MEDICAL ASSOCIATION, BROWN HOTEL  
October 3-6, 1932

**GENERAL MEETINGS**

TUESDAY, OCTOBER 4TH, 9 A. M.

Call to Order by the President.

Invocation.

Address of Welcome.

Response to Address of Welcome

Installation of President.

1. Acute Gall Bladder Disease.
2. Radiation of Uterine Cancer.
3. Recurrent Dislocation of Shoulder.
4. Treatment of General Infection with Blood Transfusion.

SPECIAL ORDER AT 12 M.

Oration in Surgery.

TUESDAY, 2:00 P. M.

1. Relative Value and Dangers of Spinal and Inhalation Anesthetics.
2. Diagnosis and Treatment of Injuries of the Abdomen.
3. Lung Abscess and Its Treatment.

PUBLIC MEETING AT 8:00 P. M.

CRYSTAL BALL ROOM

TUESDAY, OCTOBER 4

President's Address.

Annual Oration.

WEDNESDAY, OCTOBER 5TH, 9 A. M.

Case Reports (Limited 8 minutes each)

1. Case Report.
2. Case Report.
3. Case Report.
4. Diagnosis and Treatment of Empyema of Childhood.

5. Paroxysmal Tachycardia.

SYMPOSIUM ON ANEMIAS (Limited 10 minutes each) Diagnosis and Treatment of:

6. Pernicious Anemia.
7. Agranulocytosis.
8. Lymphatic Leukemia.
9. Indications in Anemia for Surgery of the Spleen.

SPECIAL ORDER AT 12:00 M.

Oration in Medicine.

WEDNESDAY, 2:00 P. M.

1. Etiology and Treatment of Asthma in Children.
2. Calcium Metabolism in Health and Disease.
3. Relation of Ear, Nose and Throat to General Infectious Disease.

SYMPOSIUM ON OBSTETRICS

(Limited 10 minutes each)

4. Pregnancy and Its Complications.
5. Labor and Its Complications.
6. Puerperium and Its Complications.

THURSDAY, OCTOBER 6TH, 9 A. M.

1. Radical Treatment of Joint Tuberculosis.
2. Relief of Prostatic Obstruction through the Urethra.

Time turned over to University of Louisville.

**ORIGINAL ARTICLES**

THE PATHOLOGY AND PHYSIOLOGY  
OF CHRONIC CHOLECYSTITIS AS  
A BASIS FOR DIAGNOSIS AND  
TREATMENT\*

G. Y. GRAVES, M. D., F. R. C. S.

Bowling Green.

Chronic cholecystitis is one of the most frequent diseases from which adults suffer. When we consider that Mentzer found, that, in two out of every three adults autopsied, some involvement of the gall bladder was present, we are faced with the seriousness of the disease. Not all of these sufferers conform to the older view which regarded as cases of cholecystitis only those who had recurring attacks of biliary colic. One of the most interesting developments of modern medicine is the gradual evolution of the idea that a great proportion of gastric distress, much semi-invalidism, and a moderate percentage of cancer is due to chronic inflammation of the gall bladder.

Gall bladder disease is twice as frequent in women as men probably due to the fact, that in pregnancy, there is a hypercholesterolemia, associated with biliary stasis, and a sedentary life. It is unusual for a woman who has borne four or more children to escape cholecystitis. The disease may occur at any age, but is commonest after the age of forty. It used to be considered that *B. typhosis* and *B. coli* were the commonest infecting organisms, because they were more frequently found in the bile. Now we regard these organisms in the bile not as the infecting organisms, but merely as the by-product excreted by the liver and holding the same place in biliary infections as a bacteria in an otherwise normal urinary tract. The streptococcus must be regarded as the causative agent in the greater number of cases. It is found twice as often as any other organism. Mingworth found it present in 34% of cultures taken from the wall of the gall bladder and in 20% from those derived from the cystic gland. These organisms usually reach the gall bladder by way of the blood stream or lymphatics. Bacteria in the bile has no more effect upon a normal gall bladder mucosa than bacteria in

\*Read before Third District Medical Society of Kentucky at Bowling Green; June 17, 1931.



troduced into a normal, untraumatized, urinary bladder, and bacteria never ascend healthy bile ducts.

The changes which these bacteria produce upon the gall bladder vary from microscopic to marked gross alterations. The mucosa will be edematous, swollen, and plentifully filled with inflammatory cells. The beautiful, delicate villi, which offered so much surface for absorption, have become thickened, flattened, and swollen; their epithelial cells filled with mucin; the intercellular spaces filled with inflammatory fluids and cells. Later granulation tissue appears, slowly followed by fibrosis.

These changes are not limited to the mucosa alone. They extend through all the coats of the gall bladder, and are at first focal collections of inflammatory cells and exudate dilated capillaries are seen. As the fibrosis continues, the muscular and elastic tissues become replaced by fibrous tissues so the gall bladder instead of being an efficient distensible, and contractile reservoir becomes a mere inert, fibrous bag. This fibrosis may lead to very thick walls which later contract causing the lumen of the gall bladder to become very small, provided the cystic duct is open. If the inflammatory process extends to the cystic duct before there is too great involvement of the gall bladder itself, a stenosis of the duct will take place, but the gall bladder will become greatly distended and filled with a whitish bile.

The strawberry gall bladder is one of the earliest results of chronic infection of the gall bladder. In this condition the outside of the gall bladder may appear normal, but if the organ is opened its reddened mucosa is studded with fine yellow specks. These specks are an altered form of cholesterol. Illingworth believes that the cholesterosis is due to two causes: (1) An increased content of cholesterol in the bile leads to an increased absorption by the mucosa of the gall bladder and (2) a change in the chemical and physical state of the absorbed but invisible cholesterol which renders it optically active and prevents its transport leaves it stored in the walls of the gall bladder. This change is most often due to chronic inflammation in the walls of the gall bladder.

Although gall stones are found in 55% to 75% of cholecystitis cases, the calculi are incidental and not essential to gall bladder disease. Too much stress has been laid upon this presence even though they are often the cause of the dramatic symptoms which compel the patient to consult her physician for relief. Cabot has aptly remarked, "Little stones like little dogs often make the loudest noise."

The factors leading to their formation are

completely understood. There are two distinct types, the cholesterol and the bilirubin calcium stone.

The cholesterol stone probably is the result of metabolic changes in the gall bladder, occurring very frequently in cases of cholesterosis. In the presence of certain chronic infections the passage of the cholesterol is delayed and becomes deposited in the mucosa. Consequently the bile soon becomes supersaturated with cholesterol, especially in the presence of a hypercholesterolemia and using detached polyps as nuclei proceeds to deposit cholesterol and thus forms stones.

The bilirubin calcium stone is found in the presence of gross infection. The infection interferes with the bile salts upon whose presence the solubility of cholesterol and of bile pigments depends. In some way, the Ph of the bile often determine the stability of the substances in the bile.

If the pathological condition were confined to the gall bladder alone, our problem would be much easier. Unfortunately the gall bladder disturbance is transmitted to other parts of the biliary tract. The liver is almost constantly involved in cholecystitis and in all probability the seriousness of the disease depends upon the damage done to the liver. This fact has a very definite place in the early mortality following gall bladder operations. By determination of the amount of phenoltetraiodophthalein in the blood (retention due to liver damage) the operative risk and the optimum time for operation may be determined to a very satisfactory degree. A high dye retention indicates a high operative risk, and operation should be undertaken only after careful consideration and with a minimum of surgery. In all cases, there is an associated hepatitis. The inflammation is chiefly in the interlobular sheaths and is apparently a pericholangitis. This would support a lymphatic spread of the infection from the gall bladder. Wilkie showed that this was true when he demonstrated that when the gall bladder was separated from the liver by the omentum, no hepatitis occurred even though the gall bladder was heavily infected.

Pancreatitis as a complication of cholecystitis is not nearly so common as many investigations believe, but it occurs frequently enough to be given very serious consideration. It is present in 5% to 25% of all cases of chronic cholecystitis. Its pathogenesis is not sufficiently clear. Whether the infection spreads through the lymphatics, by the blood stream, or by regurgitation of infected bile up the pancreatic duct in cases of spasm of the sphincter of Oddi, has not been definitely decided. Three types of pancreatitis are

found, the catarrhal, chronic interlobular, and the acute hemorrhagic. I prefer Archibald's explanation. He believes that three factors are necessary to produce pancreatitis: (1) A change in the composition of the bile due to the bacterial action which increases the proportion of bile salts, particularly the taurocholates and diminishes the mucin; (2) Spasm of the sphincter due to hyperacidity of gall stones, and (3) An abnormal increase in the pressure in the biliary system (a) by sudden blocking of the cystic duct by stone or inflammatory swelling (b) by a full meal. The regurgitation of bile under the lower pressure, especially if there is sufficient mucin to protect the pancreatic structures from the irritating bile salts, probably produce the first two varieties. The higher pressures in regurgitation carrying the highly infective bile are responsible for the acute pancreatitis.

The functions of the gall bladder are three: (1) storage of bile, (2) concentration of the bile, and (3) discharge of bile into the duodenum as needed. The storage of bile would be insignificant if it was not for the second function. Normally the gall bladder only holds one to one and one-half ounces of bile. Fibrosis of the walls in cholecystitis makes its meagre capacity even less. If the gall bladder infection interferes with its concentrating powers, as cholecystography shows; then its ability to store bile is practically absent. While both the lymphatic and blood supply are concerned with the concentration of bile, the lymphatics are the greatest factor. Inflammatory changes in their walls obliterate many of them and greatly interfere with their activity. The stasis of the blood present in chronic inflammation affect the absorptive ability of the gall bladder. Other factors are the edema of the tissues and the smaller surface of the mucosa due to thickening and flattening of the villi, which greatly decrease their power of absorption. That all this is definitely true is shown (1) by the inability to concentrate the various dyes used in cholecystography, (2) by the presence of bile in a diseased gall bladder whose composition is almost identical with that in the common duct.

The third function, the discharge of bile in the duodenum, is overrated in the normal individual. Carlson states that bile is continually produced and continually flows into the duodenum, provided there is no obstruction in the duct system, even in prolonged fasting. The inference that bile secreted during fasting is stored in the gall bladder is not true. The gall bladder is not of sufficient size to hold all the bile secreted during this period, in spite of the concentrating ability which it possesses. When we consider the in-

flamed, fibrous, non-distensible, non-concentrating, chronically infected gall bladder as a storage reservoir, the situation becomes absurd. It is known that the liver secretes about 1500 c. c. of bile daily and the digestive period is only 6 to 8 hours. Is it reasonable to expect the chronically inflamed organ to store the portion of bile produced during the fasting period and to release it during digestion? No.

The gall bladder is supposed to regulate the biliary pressure, but the tonus of the wall of the duodenum probably determines the resistance to the flow of bile in the intestine. The gall bladder may act as a safety valve to keep the pressure from becoming too great but even then it is not necessary for when the pressure becomes great enough it overcomes the resistance at the ampulla and flows into the duodenum. In chronic cholecystitis the pressure is usually at an even level instead of showing the normal variation, so that the organ does not even help regulate the intraductal pressure. As a matter of fact, reflexly it may increase the duodenal tonus to such a point that the biliary pressure may be so increased as to do serious damage to the liver.

Inflammatory lesions of the gall bladder produce disturbances of the neighboring organs in four ways: (1) by interfering with its physiological functions, (2) by reflex action, (3) by direct spread of the infection, and (4) by its toxic effects.

The physiological functions of the stomach are interfered with by the production of the hyperacid secretion, by relaxation of the pylorus allowing food to pass along before it has been thoroughly mixed and churned with the gastric juice, and by allowing the regurgitation of bile and duodenal contents into the stomach before the completion of gastric digestion.

The action of the pancreas is interfered with both by the alteration in the quality of its secretion and by the fact that it does not receive sufficient bile to act at its maximum efficiency.

Inflammatory lesions of the gall bladder spread by the lymphatic to the neighboring portions of the liver to produce a hepatitis. This is proved by the fact that the hepatitis is practically always present in this region and only present in 30% of those sections taken from the dome of the liver. Adhesions between the gall bladder and pancreas or duodenum may allow a direct spread of the infection to these organs.

That the inflammatory condition has a definite toxic effect is demonstrated that many myocardial cases, some joint infections and nephritis cases become greatly improved after the removal of the chronic gall bladder.



The symptoms and signs of cholecystitis and cholelithiasis are extremely varied. From the patient's point of view, the most important symptom is pain, which may be of three types, (1) biliary colic, (2) biliary ache, and (3) biliary dyspepsia.

Biliary colic need not detain us for it is only seen during acute exacerbations of the disease.

**Biliary Ache:** This pain has an insidious beginning; it seldom becomes acute, although often interspersed with periods of biliary colic. It is referred to the right subcostal region and to the right lumbar region, appearing to extend directly through the abdomen. Generally it varies from a feeling of vague abdominal discomfort to a definite and localized pain. The ache may cause so little inconvenience that it is scarcely noticeable to the patient or it may prostrate him during the acute exacerbations. This pain is due to infection in part or all of the biliary tract. The catarrhal condition of the bile duct, by their increased resistance to the flow, increase the tension of the liver and inflamed non-distensible gall bladder thus producing pain. When the serous covering of the gall bladder and undersurface of the diaphragm are involved, the pain may be referred to the neck and acromion through involvement to the terminal twigs of the right phrenic nerve. The lumbar ache is due to the spread of the infection of the pancreas. Possibly the pull on adhesions to neighboring organs causes part of it.

The third type of discomfort, biliary dyspepsia, is probably the most common and the least frequently diagnosed. The patient usually gives a history of a feeling of weight and fullness in the epigastrium beginning about thirty minutes after meals and lasting two or three hours. It is often accompanied by dull ache under the left scapula, flatulence from which belching and vomiting may give relief. Often the patient discovers a glass of hot water will give relief. Griffiths considers the drinking of hot water after meals by a woman as diagnostic of gall stones.

Vomiting is a common symptom especially if gall stones are present. It is almost always present in the acute exacerbations, and it is frequently violent and associated with nausea. Vomiting in chronic cholecystitis is not so frequent, occurs usually after a full meal, and is small in quantity and watery. It is associated with but little nausea. It is probably due to direct irritation of the mucous membrane of the stomach which is hypersensitive as a result of long irritation by the abnormal duodenal reflux and the increased acidity of the gastric juice. In jaundiced patients, the patient vomits a

small quantity after each meal and, as the jaundice increases, vomiting increases, as jaundice decreases vomiting decreases. It is due to the gastric irritability described above, associated with the toxic effect of bile in the blood stream on the vomiting center of the medulla.

Vomiting may be due to the chronic pancreatitis associated with gall bladder disease. The attacks generally last for several days to weeks. They are associated with a mild diarrhea, with fatty, foul-smelling, undigested stools. There is little nausea; wasting may be extreme.

Jaundice is supposed to be a classical symptom but is found only in about 10% to 20% of the cases. Jaundice associated with gall bladder disease is essentially of the obstructive type. This may be intermittent, remittent, or continuous. It may be caused by stone, adhesions or chronic pancreatitis.

Inspection of the abdomen rarely reveals anything. The most common sign of gall bladder disease is tenderness below the right costal cartilage, which may be associated with tenderness under the ensiform cartilage due to inflammatory involvement of the stomach. Occasionally there is deep tenderness about three inches to the right of the spine and on the level of the third rib. This is probably due to the spread of infection on the parietal peritoneum, and then by the extraperitoneal lymphatics to this, the most dependent point, when the patient is lying down. When the pancreas is involved, there will be an area of tenderness lower down and to the right, and often extending to the left of the second lumbar vertebrae. Percussion and auscultation often reveals the stomach to be enlarged.

Reflexly, the infection in the gall bladder may stimulate either the vagus or the lymphatic system. The vagus is stimulated in the majority of instances, but in the more acute infections there is an increased action of that portion of the sympathetic system which has been derived from the ninth thoracic segment.

Reflex irritation of the vagus has its principal action upon the stomach causing an increase in the amount and acidifying of the gastric juice, associated with a relaxed pylorus and regurgitation of the duodenal contents, which are more copious due to the increased pancreatic secretion. Alteration in the secretions of the stomach and pancreas often are associated with pain. The dyspepsia, flatulence, and often referred pain to the left scapular region are due to the hyperacidity.

Many conflicting reports as to the presence of hyperacidity, hypo-acidity, or an acidity are given in the literature. Most of them show a deficiency in free acid.

Whether this is true hypochlorhydria due to lack of secretion or a false hypersecretion of HCL, but at the same time the relaxed pylorus allows the alkaline duodenal content to pass back into the stomach, thus partially neutralizing the secretion.

In most cases of cholecystitis, the test meal will show a decrease in HCL, with a corresponding increase in the mineral chlorides suggesting that the increase at the expense of the free HCL, i. e. the acid was first secreted but later neutralized by duodenal regurgitation. If it were a true hypochlorhydria, the free HCL would be diminished in quantity, but the mineral chlorides would be about normal. In hyperechlorhydria the HCL is increased, while the mineral chlorides remain about normal.

According to Griffiths the test meal in 90% of chronic cholecystitis is of the regurgitant type, 8% true hyperechlorhydrias and 2% true hypochlorhydrias. Other explanations of the cause of increased gastric secretion are (1) the natural reaction of the stomach mucosa to a foreign alkali or (2) a general decrease in the alkalinity of the body tissues. The reflex irritability of the vagus is probably the best explanation of the regurgitant type.

The hyperechlorhydria type may be due to three causes or to a combination of them, (1) the regurgitation in the stomach is less than normal, (2) due to pancreatitis the pancreatic secretion is much less in quantity and alkalinity, or (3) due to stronger stimuli, the sympathetic system is activated causing a pylorospasm and spasm of the sphincter of Oddi. At the same time the pancreatic secretion is much smaller than normal and probably of deficient quality.

True hypochlorhydria may be due to (1) an intercurrent disease or (2) chronic gastritis due to the focal infection in the gall bladder.

No paper upon gall bladder disease could be complete without some reference to cholecystography which has reduced the diagnosis of gall bladder disease from a matter of guess work to an exact science. It embodies an entirely new radiological principle, namely the utilization of the specific functions of the biliary system to create a difference in density. Physiologically the dyes employed are excreted by the liver, reach the gall bladder in ever-increasing quantities, and there by the extraction of the water from the bile the concentration becomes great enough to render the gall bladder opaque to the x-ray. If the gall bladder is diseased, the film shows little or no shadow due to inability to concentrate the bile. Stones are often rendered visible by their contrast with the opaque dye. Fixation and persistent de-

formity of the cholecystograms are signs of pericholecystitis. Retarded appearance of the shadow and constancy of size of the cholecystograms are other signs of the pathological gall bladder. Graham found cholecystography to give the correct diagnosis as 97.5%.

The medical treatment of chronic cholecystitis needs very little comment. There is no conclusive evidence that medicine has any direct effect upon the disease itself. Its whole reputation rests upon three insecure foundations: (1) the sterilization of the bile accomplishes the cure of chronic cholecystitis; (2) that, by Lyon Meltzer duodenal drainage, the gall bladder may be drained of its pathological contents and thus bring it back to normal; and (3) cholelithiasis is notorious for its intermissions of improvement.

As for the first, pathologically the infection is deep within the gall bladder walls, it is blood borne. It is not reasonable to expect any antiseptic secreted in the bile to penetrate deeply into the muscular and serous coats. As for sterilizing the bile, Illingworth found it sterile in 60% of undoubted cases of chronic cholecystitis.

The second is based upon a wrong conception, otherwise we would give large quantities of fats which empties the gall bladder more efficiently than any other substance. Besides, if it is to be any good, it should be continuous instead of an hour or so twice a week. No one would drain an abscess or an infection in other portions of the body so inefficiently and expect good results.

The reputation of medical treatments rests upon the last factor, the intermission of symptoms. The doctor treats the patient awhile; and intermission occurs, and he thinks he has cured the woman. After the disease reasserts itself, the patient visits someone else, so the original physician is under the impression that he has helped the patient. Medicine has a definite place not in treating the cholecystitis but in treating its complications and preparing the patient for operation. Here glucose is used to aid the liver. Cardiac and renal diseases are treated. Calcium chloride is given intravenously to obviate danger of hemorrhage in jaundice.

The treatment is surgical, and the sooner surgery is resorted to the better it is for the patient. Late surgery is not entirely satisfactory, because of the resultant damage to other structures in the body. Most surgeons believe the gall bladder should be removed, but many still think that drainage of the gall bladder is the operation of choice. We must examine carefully the arguments of each school to arrive at a correct procedure to be adopted.

The proponents of routine cholecystostomy argue in favor of the operation the following



advantages: (1) Technically the operation is much easier than cholecystectomy, and the immediate death rate is lower; (2) There is no danger of injuring the deeper ducts and vessels; (3) In cases of injury, stone or new growth, blocking the common duct the gall bladder can be anastomosed to the intestines to provide an alternative route for biliary flow; (4) The operation leaves the gall bladder capable of performing its normal functions and thus should be spared. That the first and second are true there is no argument, but in an experienced operator's hands the technical difficulty can be overcome, and the mortality rate is very little higher. As for the third, operative technique is such that removal of stones, repair of strictures can be accomplished, and the leaving of the bladder, the most common of stones as a safeguard for these possibilities is not my idea of good surgery. As for the fourth possibility, that is very unlikely, as it has been shown that at least 50% of them are functionless, and about 47½% have impaired functions. Blalock found in his series that 79% had a recurrence of symptoms following cholecystostomy, 50% had to have a secondary operation. No operation can be considered a satisfactory procedure which carries such a high percentage of failures, or which so many secondary demands.

These figures are reasonable when one considers that (1) the gall bladder is often a fibrous sac incapable of expansion or contraction; (2) the infection lies in the walls of the gall bladder and within the lumen; (3) after cholecystostomy it shows no function or impaired function. These facts condemn cholecystostomy as a routine procedure. However, in special instances I believe it is the operation of choice. Drainage of the gall bladder should be reserved for (1) poor risk patients in which the technical difficulties are so great that removal carries a prohibitive risk; (2) gangrene or empyema of the gall bladder; and (3) deeply jaundiced patients with stone or stones in the common duct, a gall bladder filled with stones in which it is feared that the persistent oozing from the denuded surface will endanger the patient's life. In these instances cholecystostomy is good surgery, but the patients should be told that a secondary operation may be necessary as cholecystostomy is not an operation of choice but one of necessity.

Cholecystectomy is the operation of choice in all other instances of chronic cholecystitis for the following reasons: (1) The focus of infection is removed; (2) since most stones form in the gall bladder, the possibility of recurrence of gall stones is almost eliminated; (3) removal of the gall bladder does away with the hazard of cancer of the

gall bladder; (4) the operative mortality is only a little higher than cholecystostomy, and if we consider the secondary operations necessary for relief, the mortality will be lower after primary cholecystectomy; (5) complete relief of symptoms occurs in about from 65% to 100% of the cases. Only about 2% to 5% get no relief; (6) the gall bladder has no function which is necessary to the healthy person; (7) even if it is retained, it is functionless in a great majority of instances, so that there is no need to keep it.

There are four possible factors in the failure of cholecystectomy to relieve symptoms: (1) residual infections in the liver, pancreas, bile ducts, or appendix, which does not undergo resolutions; (2) errors in diagnosis or incomplete diagnosis; (3) spasms of the musculature in the bile duct; and (4) errors in surgical technique. Cases in the first group are usually the result of coming to operation too late. The damage is already done and persists in spite of efficient treatment of the original focus.

Persons belonging to the second group are to be pitied, for their troubles are probably the result of some doctor's carelessness or ignorance. The gall bladder may be diseased, but spastic constipation, intestinal allergy, disease of spine, or neighboring organs may be causing the major symptoms. A careful history, physical examinations, and cholecystography will eliminate many of these unsatisfactory results.

Spasm of the musculature of the bile ducts may cause the persistence of many symptoms, according to Aschoff and Sweet. Recently I saw a case which I believe was due to this cause. She has been taking morphine gr. 3/4 for the relief of biliary colic, following cholecystectomy. Ten c. c. of 10% solution of calcium gluconate given intravenously relieved. This I attributed to the depressing effect which calcium has upon smooth muscles.

The fourth cause is a distressing one. The doctor might have overlooked some calculi in the cystic, hepatic, or common duct, or proper care might not have been taken in handling the tissues so that numerous adhesions might form in the region of the duodenum causing trouble from the pull on the adhesions.

I have endeavored to show that while the gall bladder physiologically is the most insignificant unit of the digestive complex, composed of the liver, stomach, pancreas, duodenum, and gall bladder, pathologically it is probably the most important, for disease and disorders of the function of this complex originate more frequently in the gall bladder than anywhere else, and its removal

will give greater relief than any one other method of treatment.

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**Therapeutic Value of Acetylcholine.**—Villa tested experimentally the therapeutic efficacy of acetylcholine, which was introduced a few years ago but which is not widely used in the clinics. He describes the results that he secured in two cases of senile gangrene of the limbs, one case of primary endarteritis with gastric ulcer, one case of multiple arterial thrombosis with hemiplegia secondary to streptococcic endocarditis, one case of lead colic, two cases of gastric crises in association with pinal radiculitis and dorsal tabes, and one cases of dorsal tabes with lancinating pain. The author concludes that the use of acetylcholine should be known to the medical practitioner for its value as an early intervention in gangrene of arteritis or thrombosis of whatever nature, since often, before the patient reaches the hospital, the time for such intervention has passed. Certain surgical interventions on the vegetative innervation (sympathectomy, resection of cervicothoracic sympathetic nerve), with a view to modifying pathologic condition referable to an angiospastic mechanism, might well be preceded, the author thinks, by a therapeutic trial of acetylcholine.

## HEART CONDITIONS\*

H. W. GINGLES, M. D.

Hardburly.

We might be reminded that of all causes of death, heart disease heads the list. Time was when pneumonia and tuberculosis occupied the more prominent places. A little more accurate and careful diagnoses, with the added help of certain instruments of precision, together with preventive medicine's winning fight against tuberculosis, possibly have been the chief factors in bringing heart disease to its place of prominence in the death list. A statistician of the Metropolitan Life Insurance Company some time ago stated that the probability of a man, at the age of 35, dying of heart disease is four times that for tuberculosis. It has been estimated that possibly 2% of all people in the United States have some definite heart affection; approximately two and a half million people. Quite an army of cripples that would be! And cripples they truly are! The amount of disability and invalidism that these two and a half million represent is almost as tragic to think about as the 200,000 or more Cardiacs that die annually. A perusal of the death columns of the JOURNAL should give us a little sombre food for thought. I sometimes wonder, if, amid the morbidity and the mortality which doctors of medicine face daily, that it isn't the common experience for the man of medicine to occasionally stop and indulge in a little reverie himself—to speculate a bit as to the manner of his own taking off. Mighty few men, even though they be doctors, are able in advance to name the essential element in their death certificate. However, John Hunter was one of those; but he knew his disposition, and he knew his angina pectoris. As to the manner of how a majority of this assembly that's here tonight will pass out, I'll hazard the prediction that heart disease will loom large in the final call.

The stethoscope has long been the chief and most common means of determination of the condition of the patient's heart. Many a patient that is examined with the stethoscope and told that his heart is all right, may shortly thereafter show physical signs of some grave cardiac disorder. Even valvular defects may escape the ear, with the stethoscope. A modern cardiologist states that in heart diagnosis, auscultation should hold sixth place instead of first; being preceded in importance in this order: History taking, inspection, palpation, percussion, and mensuration. Inspection to include the use of the

\*Read before the Perry County Medical Society.



fluoroscope, and mensuration to include the measurement of the electric currents of the heart with the electrocardiograph. These diagnostic measures should be directed toward ascertaining the functional capacity of the cardiac muscle, and to what degree, if any, it has dilated under stress.

Hypertrophy and dilatation are two not uncommon affections of the myocardium. Hypertrophy is a compensatory process to meet a demand for extra work, or to combat a deficiency of structure, such as a valvular defect. Hypertrophy is not incompatible with good health unless an associated structural defect is not fully compensated. Dilatation may be purely physiological; in which case it may be a mildly acute process and very transitory, succeeding severe muscular effort. It is pathological only when it is permanent. Acute dilatation that is distinctly pathological, may occur in toxic goitre, in paroxysmal tachycardia, in any form of valve lesion, or an old myocardial case following exertion. Cabot states "always when you have hypertension you have hypertrophy and dilatation." In classifications of heart affections, most all authors mention myocarditis, acute and chronic. Many cardiologists write the word in quotation marks, indicating its status in terminology a bit similar to that of rheumatism. Osler avoids the use of the word, but in its stead has a long and interesting discussion of "Cardiac Insufficiency." Osborne states that "practically all acute infections cause more or less myocarditis, and it is exceedingly rare that an endocarditis occurs without an accompanying myocarditis, which condition is not diagnosed until a sudden acute dilatation comes." He further states that so-called chronic myocarditis is not an inflammation, but a long continued degeneration. Christian uses the term in a large heart with weakness, hypertrophy and dilatation. Cabot says he is not able to make a diagnosis during life, of a myocarditis; that there are no distinguishing physical signs, and that it is merely of post mortem importance. Whatever myocarditis may be, "Cardiac Insufficiency" is something very real and oftentimes presents itself to us in most alarming aspects. It has been said that the crucial factor in every heart condition is the competence or incompetence of the myocardium; and when incompetence ensues there follows what we usually speak of as "heart failure," consisting essentially of lessened rapidity of the circulation, in which the tissues fail to receive their proper supply of oxygen and food, and to be adequately relieved of their waste products. If the failure is congestive, clinically the picture presents dyspnea, engorgement of the neck veins, distention of the liver, peri-

pheral edema, and pulmonary edema, and often collections of fluid in the serous cavities. The heart has thus lost its reserve power, with which every competent heart is endowed. Unfortunately we have no means of measuring this reserve power, or to foretell when the organ will be called on to deliver to the utmost. In certain other more rapidly fatal failures, such signs and symptoms as mentioned do not show for example: in angina pectoris, Stokes-Adams syndrome, and complete coronary occlusion. Even occasionally at autopsy when presumptive evidence of heart failure is strong, no definite lesion can be found to account for it. The three common hypotheses advanced to account for cardiac failure exclusive of the congestive factor, are: an actual destructive lesion of myocardial tissue, either grossly or microscopically recognizable; an interference with the blood supply by obstructive lesions of the vessels of the coronary circulation; and lesions of the specialized conduction tissues, leading to abnormal function.

The second of these hypotheses leads us to mention angina pectoris. Some of the Life Insurance Companies have recently sent out special letters calling attention to the increasing number of cases of death claims due to angina. The certain and definite cause of angina pectoris is not known. Osler says whatever the cause, arterio-sclerosis predisposes to it. Sclerotic Aortitis is a common pathological finding. The outstanding feature is a terrific paroxysmal pain, most generally thought to be caused by an acute deficiency in the coronary circulation, and a consequent oxygen deficiency to the myocardium. Occasionally the pain may be referred to the upper abdomen and mistaken for acute indigestion, which has probably been given frequently as a cause of death. Acute indigestion probably never kills a man with a normal heart.

A condition which may, clinically, be confused with angina pectoris is coronary thrombosis. A distinction between the two conditions is only of recent development; as it was formerly thought that acute coronary thrombosis was a severe angina pectoris or *status anginosus*. The chief points of differential diagnosis are: in onset in angina it is during exertion; and in coronary thrombosis during rest. The duration of the attack is short in angina; may last for hours or days in thrombosis. The nitrites often relieve angina; they do not relieve thrombosis. While the electrocardiograph is chiefly useful in work on disturbances of rhythm, coronary thrombosis is another condition in which electrocardiograms are valuable; and by means of them 'tis possible to locate a lesion in the coronary system.

Inflammation of the endocardium is generally confined to the region of the valves; and the valves most frequently inflamed are the mitral and aortic. The greatest etiologic factor is rheumatic fever, which involves the mitral most commonly. There are no positive or characteristic signs of acute endocarditis. The great majority of cases are latent, and there is no indication early of cardiac trouble. The symptoms to excite suspicion would be increased rapidity of the heart, and an increase of the fever without aggravation of the Arthritis. Post mortem findings include soft friable vegetations on the heart valves. Particles from these vegetations may become loosened and float free in the blood stream, causing embolic obstruction in different parts of the body. There is always the probability of adhesions or contractions occurring from the healing of the ulcerated surfaces. Thus the valvular defects are developed. Of these, as was just stated, the mitral and aortic are the most important. It has long been the prevailing belief that mitral regurgitation (or mitral insufficiency) was the predominant mitral lesion. It seems to be the general opinion now that not regurgitation but stenosis of the mitral valve is the lesion that predominates and works the most harm, especially in rheumatic endocarditis. To quote from Cabot: "I know no means by which we can recognize with certainty either ante-mortem or post-mortem that mitral regurgitation is, or has been, a fact. That there may be regurgitation through the mitral valve at any period of rheumatic mitral disease, is entirely possible. Early cockscomb vegetations may hold the valves apart so that they cannot close. Relaxation of the papillary muscles or shortening of the tendinous chords may well permit a reflux; but so far as I have been able to observe in 5500 post-mortems, the rheumatic lesions of the mitral valve are almost never such as one could reasonably expect to produce regurgitation alone, i. e., without Stenosis as well." He further states that some regurgitation may accompany certain other cardiac conditions, but that in his opinion in all these cases the mitral regurgitation, if it occurs, is a minor result (like congested lungs); never a primary cause. "In typical cases of stenosis the valves are found fused together and stiffened to form an irregular cone projecting into the ventricle from the direction of the auricle. The orifice is never round but presents an irregular slit (fish-mouth or button-hole) which may admit one finger (instead of three as normally) or may barely admit a probe. In the earliest stages at which the stenosis can be recognized with certainty, there are no abnormal signs when the patient is at rest except a systolic murmur. On auscultation

the physical signs are so fleeting and inconstant that one can not be sure just what the lesion is." A pre-systolic murmur may be noted after exertion, in the early stage; which later may become diastolic. The murmur is always accentuated at the apex; and there is also accentuation of the pulmonary closure. Eventually there may be decompensation, attended by arrhythmia: generally auricular fibrillation. But long before fibrillation ensues, mitral stenosis is apt to be associated with pulmonary congestion, haemoptysis, venous congestion of the head and face, and occasionally with cerebral embolism. This is the valvular heart lesion that we should be on the lookout for, and the one we are going to encounter the most often.

The next most important and probably the most easily recognized of all valvular lesions, is aortic insufficiency. Aortic valve defects are most commonly arterio-sclerotic or syphilitic in origin. 'Tis a singular fact that syphilis practically never attacks any other valve than the Aortic. The diastolic murmur loudest at the base, accentuated over the aortic orifice, transmitted in all directions, and with marked pulsations of the arteries (the "water-hammer" pulse), make it not especially difficult to distinguish.

Functional or hemic murmurs are not uncommonly encountered, especially in children. These murmurs are practically always systolic in time, and are best heard at the base. There is no accompanying enlargement of the heart, or pathological accentuation of the second sound. They are evanescent in character and generally of little significance.

The last few years cardiac arrhythmias have been given much attention in medical literature. The development and more extended use of the electrocardiograph has probably stimulated this interest. Preliminary to mentioning some of these irregularities, it may be well to briefly review the physiology of the heart-beat. Quoting from Gaskell: "the muscle fibres of the heart possess the power of rhythmically creating a stimulus, of being able to receive a stimulus, of responding to a stimulus by contracting, of conveying the stimulus from muscle fibre to muscle fibre, and of maintaining a certain ill-defined condition called tone." In the normal heart-beat there is contraction of the chambers in proper sequence, due to a stimulus which originates in the sino-auricular node sometimes referred to as the "pace-maker," and located in the wall of the right auricle close to the mouth of the superior vena cava. This node originates regular waves of contraction, averaging about 72 per minute, which pass through the walls of the auricles, by way of the node of Tawara and on through the auriculo-ventricular bundle of His, which



divides to send branches to the two ventricles. The stimulus to contraction requires a definite period for preparation; and in the normal, the interval between stimuli is constant. Any disturbance to this wonderful phenomenon constitutes arrhythmia. The most important of the irregularities of the heart is auricular fibrillation, which comprises, according to Lewis, about 40%. It may be seen in the last stages of mitral stenosis, and is essentially a sign of grave myocardial pathology. It is characterized by the most absolute irregularity, and produces a pulse in which no two successive beats are alike. The auricles do not contract from a single sinus impulse, but are in diastole, with many fibrillary twitchings arising from pathological impulses originating in many areas. These numerous abnormal impulses all come to the bundle of His, but only some of them are able to get across, and these reach the ventricle in irregular fashion, thus producing disturbed and irregular contractions of the ventricle. This absolute irregularity of the pulse may enable one to make the diagnosis; yet there may not be perfect certainty without venous pulse tracings and electrocardiographic records. Osborne states that "it seems to be probable that more than half of all the cases of heart failure are due to auricular fibrillation, or at least are aggravated by it.

Premature contractions or extra-systoles, another disturbance of rhythm, is only a little less common than auricular fibrillation. They are caused by pathological impulses which may arise either in the auricle or ventricle. They may be recognized clinically by the fact that they are followed by a pause of such a length that the premature contraction plus the pause, is almost exactly equal in time to two normal contractions. This condition usually is of no serious significance. It may continue through life and give little or no trouble; although Osler warns that it should not always be considered lightly; as the patient with an extra-systole may return in two or three years with an auricular fibrillation.

Sinus arrhythmia is an irregularity often seen; although it is not pathological. It means ordinarily the physiological variation of the heart's rate in connection with the act of breathing.

Paroxysmal tachycardia is an extremely rapid rate of the heart—around 150 or 200 to the minute. There is no disturbance of rhythm. When the rate is much above 200, it is spoken of as auricular flutter.

Heart block presents in its outstanding features, a slow pulse—(30 or 40 per minute), and independence of rhythm of the auricles and ventricles in contraction. Path-

ological changes in the bundle of His, thus interfering with impulse conduction from the auricles to the ventricles, is responsible for heart block. While an abnormally slow pulse excites suspicion, a certain diagnosis of heart block cannot be made without an electrocardiogram. Stokes-Adams syndrome may occur with this condition. While the term is not synonymous with heart block, it means heart block plus cerebral attacks and visible auricular impulses in the veins of the neck.

Without attempting to discuss therapy in regard to the heart disorders that have been mentioned, and in the light of the known etiology, it could well be said that the ideal treatment of heart affections from the modern point of view, consists in their prevention. As long as we have rheumatic fever, and nephritis and syphilis and arteriosclerosis, and focal infection, all as they exist today, just so long will there be 200,000 or more cardiacs to die annually; and the two and a half million struggle desperately for existence. Of course these underlying causes will all never be removed, but at least there may be some ground for hope that in the future preventive medicine may be a power influence in lessening the high mortality from these affections.

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**Studies in Complete Heart Block.**—Ellis presents an analysis of 43 cases of complete auriculoventricular block in patients ranging in age from 9 weeks to 78 years. Seventy per cent of the patients were over 40 years of age and the same percentage were males. In 29 cases the block was permanent, while in the remainder it was intermittent or temporary. Fifty-two per cent of the cases of permanent block were due to arteriosclerosis, 31 per cent were of undetermined origin, but in most of these instances were probably either congenital or dependent on an acute infection. Diphtheria, syphilis and rheumatic infection were responsible for a small number of cases. Digitalis was the chief etiologic agent producing transitory block, although arteriosclerosis and infections caused a lesser proportion. Complete heart block alone may exist for very prolonged periods of time without damaging the health of the patient. Four cases are recorded in which the block is known to have existed for 24, 15, 14 and 7 years, respectively, and 2 more in which it has almost certainly lasted 9 years. The chief factors governing the prognosis appear to be etiology, age, Adams-Stokes seizures, electrocardiographic abnormalities and cardiac size.

## THE PRESENT STATUS OF AGRANULOCYTOSIS\*

MORRIS FLEXNER, M. D.

Louisville.

The general impression seems to prevail among the laity and many members of the medical profession as well, that some poorly understood natural force possesses the ability from time to time to infest this earth with new and horrible diseases. About the time some professor of medicine thinks he has his text book up to the minute there comes a flood of new material, new terminology, new clinical pictures and syndromes requiring new chapters and much revision of the existing knowledge. This has been the experience of all of us who have practised medicine for from five to twenty years. I may recall a few specific instances: encephalitis of the lethargic type received little or no attention until it made its universal appearance following the war influenza pandemic. Recently types of encephalitis of a rather typical clinical course, differing from the lethargic type have appeared. Tularemia and the Brucella infections are certainly new comers who probably have existed for years. The disease which I am to discuss this evening was first described as a clinical entity only ten years ago. A few cases trickled into the literature over a period of five or six years. Recently there has been a deluge. Has this disease recurred or can its manifold presence be explained on the basis of better clinical study and keener diagnostic acumen? Personally I believe the disease is increasing. Certainly careful routine blood counts have been done in enough good hospitals and clinics for the past ten years to have recognized as striking a clinical picture as this.

My own experience with this malady is limited to four cases, all fatal. I should like to consider these briefly before giving a resume of some of the important contributions in the literature on this subject.

The first case was seen with Dr. Lee Kahn, January 29, 1930, the patient being a female, 70 years old, a widow. Three weeks before admission to the hospital she had an erysipelatous infection of the left forearm ending in a localized infection necessitating drainage; leaving her much below par. Before being brought to the hospital she had suffered an acute gastro-intestinal infection with fever and great weakness. On admission patient was extremely ill, temperature 104°, pulse 120, respiration 30. She was quite flighty, face flushed, teeth, only a few left in each arch, in good condition. Throat slightly in-

jected, left tonsil seemed greatly congested being brownish in color. No exudate seen. Submaxillary gland on left enlarged; cervicals slightly enlarged. Subcutaneous oedema of this area, quite soft, skin somewhat redder than normal. The left forearm, the site of the former erysipelas and operation seemed redder than normal. Physical examination revealed little else. From the laboratory standpoint white blood cells on admission were 1,300, only eight polymorphonuclear and thirty-three lymphocytes being found on two whole slides. Red blood cells 4,210,000; hemoglobin (Tallquists) 55%. The next morning the white cells had fallen to 350, all lymphocytes. A count by Dr. J. D. Allen on January 28, 1930, is as follows: Hemoglobin 58%, (Sahli), red blood cells, 3,980,000, white blood cells 250. Differential count 100% lymphocytes. The red cells showed a few microcytes, a number of megakaryocytes, a number of poikilocytes, marked polychromatophilia. The blood platelets were apparently increased. The urine showed albumin, two plus, and many coarsely granular casts. Patient was given hot compresses to neck, fluids forced by proctoclysis as deglutition was interfered with. She was transfused the day following admission and died four or five hours afterwards. No autopsy was obtained but examination of the bone marrow by Dr. A. J. Miller was allowed and was as follows:

Microscopic description: Sections of the marrow show it to be almost entirely fat. There are a few spicules of bone and a moderate number of blood vessels. In very small areas here and there are cells in addition to the fat tissue cells. These are probably remnants of hematopoietic tissue, but the cells are small, atrophic and inactive. There are no proliferating marrow cells anywhere. There are small groups of fat cells which are filled in by amorphous material.

Microscopic diagnosis: Atrophic bone marrow (fatty marrow).

The second case I saw was in March, 1930, a woman aged fifty-eight, seen with Dr. David Cohen. The patient was in extremis, having been ill a few days with a herpes zoster of the neck with a subsequent skin infection. The skin of the neck was indurated, bluish purple. The patient was delirious with high fever, rapid pulse, of poor volume. At that time the blood count was; white blood cells 2,100, polymorphonuclear 12%, lymphocytes 88%. Dr. Weeter who made the count thought the polymorphs were all staff forms much degenerated and poorly staining. Nothing could be done because of the condition of the patient and she died within a few hours, after being moved to a hospital in the hope that transfusion might be of value. The question in this case is as to whether it is a true case

\*Read before the Society of Physicians and Surgeons, Louisville, February 18, 1932.



of agranulocytosis or one of sepsis with leucopenia. Unfortunately no blood counts were made later on the fatal day. Certainly it is a very closely allied condition.

The third case occurred in my own practice, a woman aged thirty-eight, who had been under my care off and on for minor ailments over a period of five years. No blood count was made previous to the final illness. She presented herself on May the 2nd, 1931 at which time she did not look well. Patient had reduced herself considerably by dieting, said that she had been ill all winter, having had a stubborn cystitis and recently a facial neuralgia. One week before on April the 28th, 1931, she had two teeth removed hoping to relieve the neuralgia. There had been no pain at this site for two days after which it returned and persisted. She refused examination at that time but promised to return in two days after to be looked over. She returned complaining still of feeling ill and peculiar. Temperature 99°, pulse 96, blood pressure 104/70. The two sockets in her gums were healing slowly, were injected and showed some slight grayish exudate. Throat was also slightly injected; herpes present on lip. Physical examination otherwise negative. Blood count in office: hemaglobin (Sahli) 78%, red blood cells 4,070,000; white blood cells 920. Differential; polymorphonuclear 2%, segmented, lymphocytes 98%. Check by Dr. Weeter; white blood cells 870, differential, polymorphonuclear 1% segmented, and lymphocytes 99%.

She was at once sent to the hospital and that afternoon given a direct transfusion of 600 c. c. blood by Dr. Wallace Frank. Dr. Jesse Simpson treated the infection of the mouth and throat using sodium perborate wash with applications of silver nitrate. The next morning she was given 10 c. c. of leucocytic extract and an x-ray exposure over the long bones by Dr. Keith. Upon the advice of Dr. Stewart Roberts, of Atlanta, following a telephonic conversation, I injected small amounts of turpentine mixed with novocain intradermally in four places and a culture of staphylococcus aureus in two small areas. The rationale of this Dr. Roberts explained on the grounds that at that time and in his experience also the cases that had recovered were those showing multiple infections and he felt the idea of producing them if not already present, a good one. Patient was also started on liver extract. The following day, (May the 6th), leucocytic extract was repeated. The temperature began to rise, varying from 101° to 103°. She felt quite miserable, was nauseated most of the time and on May the 7th, another transfusion of 375 c. c. of blood was given by Dr. Frank. This was from a donor who had been given a sterile

turpentine abscess and at the time of the transfusion had a white count of approximately 25,000. Blood count made previous to the transfusion was hemaglobin 70%, red blood cells 3,900,000, white blood cells 300; lymphocytes 99% and endothelial cells 1%. In spite of this transfusion no granulocytes could be found in the smear at the next count made the following day. It was as follows: hemaglobin 79%, red blood cells 4,100,000, white blood cells 150, lymphocytes 90%, endothelial cells 9% and one questionable Turek irritation cell. She became gradually more toxic, slight jaundice appeared and she showed evidence of circulatory failure; temperature and pulse became elevated and she died with a terminal pulmonary edema, with frothy sanguineous expectoration. A partial autopsy was allowed and performed by Dr. Miller who reported the following:

"Microscopy. Lymph Node: There are no germinal centers. Remnants of them, however, can be seen here and there and in these areas there are a few degenerating cells which appear to be those of the germinal centers of the node, but the area is filled in almost entirely by recently formed scar tissue. This tissue is similar to the reticulum of the node. The nuclei of these cells are pyknotic. Other portions of the node are made up of adult lymphocytes which appear normal. The lymph sinuses are dilated and contain great numbers of endothelial cells. Many of these have phagocytized erythrocytes; in other places the reticulum cells have erythrocytes in their cytoplasm.

Abscess Wall: Section is composed of fat and other connective tissue in which there is no leucocytic infiltration except for an occasional lymphocyte. Much of the tissue is necrotic; some of the blood vessels are thrombosed. There is hemorrhage throughout practically all of the section.

The striking thing is large masses of cocci found in the corium and subcutaneous fat throughout all of the section. These are apparently spreading throughout the tissue with no barrier about them whatever. With the oil immersion lens small groups of these organism can be seen everywhere. Much of the tissue is necrotic.

Bone Marrow: The section is composed of fibrous connective tissue and fat, and is quite vascular. All of the vessels are remarkable in that they are thickened because of proliferation of the intima. Some of them are closed. There are no germinal centers whatever. There is no inflammatory reaction about the vessels, though there is hyperplasia of the connective tissue about them, as well as the intima, and in many of them it appears that the cells in all coats of the vessel are hyperplastic. Lymph nodes are reviewed

with special attention to the vessels, but there is no comparable vessel change in these tissues. It cannot be demonstrated that the degeneration of the germinal centers is secondary to vascular damage; in fact, a number of functioning capillaries are found in the germinal centers which are practically destroyed."

One of the interesting points about this case is the fact that the patient's mother suffered an attack in New York one year before, of a similar nature. She was under the care of Dr. Robert Herrick who told me that at no time had her white count been below 1000 with a very low polymorphonuclear count and that on admission to the hospital without any explanation the count began to rise and after a week or ten days was practically normal.

The fourth case was seen with Dr. Raymond Evans on August the 18th, 1931 in his brother, a physician. This case was the most fulminating of the group for the previous day the patient had assisted at two operations, although he had a sore throat at the time and did not feel well. He was seen by Drs. Pryor and Vaughan who thought he had an acute follicular tonsillitis. The pain on the right side was agonizing and no local thing gave relief. Throat culture by Dr. Weeter at eleven a. m. showed streptococcus viridans, staphylococcus albus and a diphtheroid bacillus. His fever was quite high, varying from 104° to 105.6° and he had one severe chill. First blood count made at 1 p. m. on August the 18th, the second day of his illness, showed white blood cells 5,400 with 97% lymphocytes and 3% neutrophils. At 3 p. m. a count by Dr. Weeter showed 1,100 white cells, 1% polymorphonuclear and 99% lymphocytes. At 5 p. m. white blood count 900 with no granulocytes. He was moved to a hospital and Dr. Evans talked to me an hour later on the telephone and I advised giving him a transfusion. He had a severe rigor which lasted twenty-five minutes followed by a temperature rise to 110° axillary, pulse 145, respiration 42. His pulse was very poor volume, weak. In spite of vigorous stimulation the patient died at midnight. In all, this case hardly lasted forty-eight hours. In its rapidity it reminds one of the reported cases of septic sore throat or the fulminating scarlet fever cases. No blood cultures were made and no autopsy performed. In connection with this case it is of interest to note the comparatively large number of cases of this disease reported in physicians. Of the few cases recognized in this city I know of two fatal cases among physicians.

Credit is given to Werner Schultz for first forcibly calling the attention of the profession to this disease in 1922, and he gave it

the name of "agranulocytosis." In 1902 P. K. Brown, an American, described a case but did not recognize it as an unusual condition and it was lost in the literature. Friedman in 1923 associating the throat condition suggested the name "Angina Agranulocitica." Beatrice Lovett, an American, in 1924 made an excellent report, and got credit for first recognizing the disease in this country. Several names have been suggested for the clinical picture, many objecting to the present term. Schilling suggested "Malignant Neutropenia," Stewart Roberts "Acute Agranulosis," Fitzhugh and Krumbhaar "Pernicious Leucopenia" Frank "Panmyelophthisis." "Idiopathic Neutropenia" by Baldridge and Needle. Schultz felt that he was dealing with a distinct disease entity and there has been much discussion since as to whether he was or not. There are certainly many other agents that may depress bone marrow actively and give similar pictures, the most prominent among these being the chemical depressants as benzol and arsenine (arsphenamine) thorium X, radium and x-ray. Certain diseases as typhoid, typhus, measles, mumps, malaria, influenza, dengue fever and roseola infantum may give pronounced leucopenias. Septicemia with hemolytic streptococci, streptococci viridans, staphylococci, *B. pyocyaneus*, *B. melitensis*, pneumococci, *B. Coli* have been found in this disease. From the mucus membranes particularly of the mouth have been recovered Vincent's organism, pneumococci, many varieties of staphylococci, the diphtheria bacilli and a host of others.

The typical Schultz picture is that of an acute febrile attack, frequently associated with an angina, great prostration, frequently jaundice, a normal red blood count, a marked leucopenia with very few or totally absent granulocytes, a normal number of blood platelets, with a mortality practically 100%. Before long many variations of the picture began to appear and many explanations of etiology were offered. Ulcerations of other mucus membranes, especially about the vagina and rectum were described and most cases were found not to be jaundiced, although some showed enlargement of the liver and spleen. At autopsy a characteristic aplasia of the bone marrow was found.

One of the best studied cases throwing some light on the clinical nature of this disease was presented by Roberts and Kracke in September, 1930. They recall the fact that the red bone marrow makes erythrocytes, granular leucocytes and platelets and that the life of the granular element in the blood stream is from three to five days. If the bone marrow were to cease functioning it would take, three, four or five days before the fact would show itself by the granulo-



cytes disappearing from the blood. They do not believe the cells are destroyed in the blood stream, as no evidence points to this. In other words, they think the disease to be one of bone marrow dysfunction, an afunetion in the myelocytic division, and that the disease exists in the bone marrow before it appears in the blood stream and in the blood stream before it appears clinically. In their case presented they were able to demonstrate this sequence perfectly following a woman of 72 years through the primary attack and then making daily blood counts until the fatal recurrence occurred over two months later. They showed that the clinical onset did not occur until four days after the blood stream showed changes which must have been from six to eight days after the bone marrow became affected. They explain the marked physical collapse of those patients on the absence of the polymorphonuclears, recalling that these cells contribute largely to the normal active immunity of the tissues and themselves are the main source of the complement. Without them bacterial invasion can run rampant. From this study they concluded that the disease is finally one of the bone marrow, followed by changes in the blood stream, then by the clinical onset, then by sepsis frequently and state finally that loss of the granulocytes is incompatible with life.

Taussig and Schnoebelen in December, 1931, presented an excellent study of four cases and statistically reviewed 334 authentic cases. Among their interesting comments are the following:

1st. The disease exists almost twice as often in females as in males. The mortality in males is 75%, in females 77%.

2nd. The inflammatory lesions are distributed as follows: Angina 74%, stomatitis 11%, no lesion of any kind 5%, anal ulcers 4%, other lesions 6%.

3rd. The age incidence: under 20 years, 9%, from 20 to 40 years, 38%; from 40 to 60 years, 40%, over 60 years 13%.

4th. Results of therapeutic measures:

	cases	deaths	mortality
a By irradiation	64	34	53%
b By transfusion	53	34	64%
c By arspenamine	33	24	73%
d By other therapeutic measures	178	133	75%

The therapeutic measures at hand which might be of value in controlling this disease are limited. Repeated transfusion of whole blood has been used practically universally either daily in small amounts or regular amounts every other day. The results have been fairly satisfactory only. Friedman in 1927 suggested the use of the x ray on the long bones—using 1/20 Erythema dose. Wal-

ters and Firor in May, 1931 reported four recoveries out of five cases following Friedman's technique and in the table presented above it was found that this agent alone gave the best results. Taussig and Schnoebelen believe Friedman's dosage too low and were forced to use much larger doses in three of their cases before any response was obtained. They frequently used five times as much as Friedman, but add the following note of caution, "whether the large dose is safe as well as effective remains to be determined by further experience." Certainly every case of agranulocytosis should receive the benefit of x-ray therapy.

Reznikoff in December 1930 reported recovery of three cases following the injection of purine bases using salts of adenine and guanine, although he erroneously referred to these as "nucleotides." He used .5 gm in 20 c. c. once a day intravenously and recently has been using it as often as twice a day.

In November, 1931 Jackson and co-workers reported their results using a Pentose nucleotide. They used this in 20 cases, two being benzol poisoning, thirteen agranulocytosis, and five cases of sepsis with severe leucopenia. Their results were strikingly good, all of the cases recovering except five of the agranulocytosis. While they feel so small a series is only of suggestive value they do feel it worthy of a trial in malignant neutropenia. In chronic cases they injected the material intramuscularly, in acutely ill, intravenously.

As in every disease of unknown etiology and without specific therapy, many suggestions are made and many cases reported to show therapeutic instruments of value. Evans in September, 1931 reports a case in a physician aged 57, who had been ill with high fever, whose white blood count on the 7th day was 1,500 with 5% polymorphonuclear. The next day quinine sulphate was started in 20 grain doses and in three days he received 160 grains. His temperature fell by crisis and white count rose to 3,500 with 46% p. m. n. While this would probably be classed as a mild type of the disease, the therapeutic response was certainly striking.

Every one is agreed that care of the mucus membrane lesions is essential. How this is done I feel is of minor importance. Every type of antiseptic has been suggested and used.

Liver extract has been given in a number of cases with the hope that it might act in a similar fashion to the way it arouses the erythropoietic system. Taussig thought he saw definite results in one of his cases.

Many authors call attention to the relapsing nature of the disease. There have been several cases who have recovered from the initial attack, to think themselves well, only

to succumb to the second attack a few weeks or months later. Blumer and Roberts have both stressed this character of the disease. For that reason frequent blood counts must be performed on all supposed recovered cases.

Fitzhugh and Krumbhaar in January, 1932 report a case with autopsy findings in which the bone marrow, contrary to the usual findings of aplasia, showed "actively hemopoietic" areas, filled with myelocytes, promyelocytes and myeloblasts where the peripheral blood contained only 200 white cells per cubic meter, all lymphocytes. They propose the theory that a "maturation factor" is at work either arresting development of white cells in their formative centers or producing degenerative changes in them before sufficient development for normal migration into the blood stream or possibly a combination of both factors. This hypothetical factor would conceivably check the granular series of blood cells at the myeloblast-myelocyte stage in the bone marrow and the lymphocyte series at or near the lymphoblast stage in the spleen and lymph node. From this they draw the obvious analogy to pernicious anemia. For this reason they suggest the name "pernicious leukopenia."

Finally I wish to call the attention of all interested in this subject to a recent experimental study of this disease by Fried and Dameshek, published in January, 1932. Working with rabbits and a culture of *Salmonella Suipestifer* they were able to produce a picture very similar to the disease found in the human. By varying their dosage they produced increasing leucopenia up to agranulocytosis, with an aplasia of the bone marrow confined to the myelopoietic system. They report finding a marked increase in the monocytes and histocytes, the latter being macrophages, in the case given small doses. They have observed similar cells in large number in human cases that recovered. It is hoped with this as a basis some therapeutic agent of real permanent value may evolve.

In concluding I would like to go on record as supporting Stewart Robert's idea as to the evolution of the disease and Fitzhugh's and Krumbhaar hypothesis as to the cause. There is only one point at which I am at variance and that is concerning the destruction of the white cells in the blood stream. In the third case I reported it does seem as if some granulocytes should have been found twenty-four hours after a transfusion of 375 c. c. of blood containing 25,000 leucocytes per c mm. I can only understand this by assuming the presence of some lytic specific ferment or toxine in the circulatory blood.

All of us will see more cases of this disease and I feel each case should be given the benefit of: First, the x-ray, second, transfusion;

third, purine bases or nucleotides, and even then I am forced to agree with Dr. Louis Hamberger, who concludes his very excellent article with "even with such a program of therapy as outlined, one approaches the treatment of these patients with hope rather than assurance."

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#### CHOLECYSTECTOMY\*

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Barbourville.

The following case is reported with the wish that the extreme youth of the patient for which a cholecystectomy was done will elicit comment from the profession.

A boy well developed and nourished and lacking a few days of being seven years old was brought to my hospital for an operation for acute appendicitis.

The history obtained from the mother was that the child had had most of the diseases of childhood and with the exception of a few attacks of indigestion, as she described them, which cleared up after a purgative, had been as healthy as the average child.

Upon examination I found this boy with a temperature of 101 F., complaining of considerable pain in abdomen, more intense in right side. Palpation revealed tenderness and rigidity in right iliac fossa and extending up to the ribs. Upon very careful palpation I could outline a tense smooth tumor in the region of the gall bladder.

I opened the abdomen with a right rectus incision. Removed the appendix which was normal and extended the incision upward until the gall bladder was visible.

The bladder was lusterless and distended almost to the bursting point. Being reluctant to remove the gall bladder in one so young

\*Read before the Knox County Medical Society.



I aspirated it and found only tenaceous mucus with entire absence of bile. I could not pass the duct with any probe. I then removed the gall bladder, which was much easier than in the adult and closed the wound without drainage. When the patient left the table he had a noticeable degree of shock but not alarming.

He made a rapid and uneventful recovery and has been in perfect health ever since. In fact so perfect that since that time I have removed his tonsils. Today he is robust and a real boy.

If this is unusual I will welcome comments, if not unusual I should like to know. This operation was done about six months ago.

### TULAREMIA\*

J. M. BLADES, M. D.

Butler.

Occupies a unique place in medical history, due to the fact that it was born of a California ground squirrel and elucidated, from beginning to end, by American investigation alone. Prevalent in the United States, Japan and Russia, Tularemia has abruptly become a world recognized new disease of men, and has taken its place in Medical Literature of every country. It is a disease discovered by the United States Public Health Service, and for which fifteen United States Public Health Service workers have been victims of laboratory infection, so assiduously and unselfishly did they pursue their experiments. It is in every respect the first American disease, and the physicians of this country should be thrilled by the thought that our knowledge of this disease has been entirely developed by American workers. Victor C. Vaughn aptly characterizes Tularemia as "A disease discovered by the United States Public Health Service." No less than thirty-four published contributions, concerned directly with this disease, have appeared in the Public Health Reports.

To Edward Francis, Surgeon, American Medicine owes its highest tribute, because he was the guiding spirit which has made this accomplishment possible.

Up to 1924 but 15 cases in human beings had been reported. During the four years from 1925 to 1929 eight hundred cases were recognized in the United States. Perhaps the earliest written description of Tularemia in human beings appears in a letter written in 1904 by a fifteen year old boy to his sister. This is what he wrote. "Three weeks ago I went hunting on the old Ranch. And the results of the hunt was twelve rabbits. About

eighteen days ago I got what appeared to be a sliver in the palm of my hand. In three days the hand began to swell slightly. Two weeks from yesterday I was taken sick, and was laid up for four days. My temperature went to 104. About the third day I noticed two very sore lumps, one at my elbow, and another at my shoulder. I showed my hands to papa (Dr. Theodore Johnson). He diagnosed it as blood poisoning, and burned the thing out with Nitric Acid, Carbolic not being strong enough. Since then he has cut it open three times, the pus seeming to form deeper in the hand. Yesterday he took me to Dr. Goff. He pinched the lumps and told me what I already knew, that the sores on my hand was the cause of the lumps. In the afternoon papa got out his lancet, and after injecting cocaine, sawed a place about an inch long, and three-eighths of an inch deep. He scraped the sides and bandaged it up."

Twenty-four years after the infection described in this letter, the father (Dr. Johnson) had recognized the similarity between the illness of his son, and the description of Tularemia which he had encountered in medical literature and the blood serum of his son who was now 39 years of age, was found by Dr. Francis to agglutinate *Bacterium Tularensis* in the dilution of 1 to 160. Thus confirming the diagnosis of Tularemia after a lapse of twenty-four years.

The next available description of human cases of the disease appears in a letter written in 1907 by Ancil Martin an Ophthalmic Surgeon of Phoenix, Ariz to Frederick Noty of the University of Michigan. He wrote, "There have been, during the summer, several individuals in this locality who have suffered from an infection as result of skinning and dressing wild rabbits. Three of these persons have had their primary lesions in or about the eye. Small abscesses formed in the lids, and on the bulbar conjunctiva as well. In one case the Cornea was involved. The preauricular gland being involved as was the anterior cervical and submaxillary. At the outset there were chills, profuse sweating, temperature of from 2° to 5°, rapid pulse lasting several days. The glands supplicated and all were evacuated. There were no deaths, and in one instance the infection was in the foot and others in the hands."

In 1925, eighteen years after the original infection, Dr. Francis found anti-tularensis agglutinins still present in serum of one of the five patients.

After the earthquake of 1906, human cases of bubonic plague appeared in alarming numbers in and about San Francisco. During years of 1908 to 1911 George McCoy, now director of Hygienic Laboratory at Washington, D. C. was detailed to this territory

\*Read before the Licking Valley Medical Society, June 11, 1931.

as Director of the United States Public Health Service Plague Laboratory. His duties were to examine rats, and ground squirrels, for evidence of bubonic plague.

In 1912 McCoy and Chapin reported their discovery of the organism of the plague like disease of the California ground squirrel. After many attempts to produce growth on the regular media to fail, they finally succeeded in growing an organism on coagulated egg yolk media.

They named the *Bacterium Tularensis* after Tulare County California in which the discovery was made. In making this discovery, Chapin was incapacitated for twenty days by some febrile illness, but no glandular involvement on returning to his laboratory work, he discovered in his own serum complement binding bodies and agglutinins of the organism *Tularemia* which they had isolated from the blood of the ground squirrels affected.

This was the first record of the identification of the disease in man as the result of Serological studies.

It was in September 1912 that Wm. B. Wherry of University of Cincinnati and Dr. B. H. Lamb described the first case of infection in man bacteriologically. The patient, a twenty-eight year old meat cutter, examined by Derrick T. Vail, ophthalmologist, who afterward reported in his paper that the case presented such unique, alarming and peculiar ocular symptoms that it was impossible for anything written to render a clinical diagnosis.

Dr. Vail found on left palpebral conjunctiva about ten discrete, deep, round, yellow, necrotic ulcers. The surrounding membranes were deep red and edematous. The preauricular submaxillary, and upper cervical lymph nodes were painfully enlarged. A pustular eruption developed over the left malar region. Patient lost weight rapidly and all evidence of general infection.

The diagnosis of glanders was made and patient was sent to City Hospital. Cultures and smears were made but no growth was found during a month's observation, but when the cultures were grown on coagulated yolk of hen's egg they succeeded in growing the same organism which McCoy and Chapin had isolated from the ground squirrel.

Forty-nine guinea pigs, three Belgian hares, three white rats, and three kittens were inoculated with infected spleen juice. The pigs succumbed on the fourth and fifth days afterward. The rabbits were used for the eye inoculations and the appearance of the conjunctiva was similar to that of the human case. The white rats died in three days and the kittens did not develop the disease. The investigator later isolated *Bacterium Tularensis* from two cotton tail rabbits found dead

in Southern Indiana, after which they published the first warning of the danger of transfer from wild rabbits to man.

In 1915 and 1917 Drs. Sattler and Lamb of Cincinnati described similar cases of "Conjunctivitis *Tularensis*." A name introduced by Dr. Lamb.

These patients had dressed rabbits previous to the development of disease. These alert observers were the first to recognize that wild rabbits constitute the important reservoir of infection, and in the Journal of the American Medical Association December 5th, 1914, they had a paper entitled "Discovery of *Bacterium Tularensis* in Wild Rabbits, and the danger of its transfer to Man."

In 1919 Dr. Francis was assigned to investigate the disease which was incapacitating so many ranchers and farmers in Utah.

This disease was called Deer-Fly Fever. Dr. Francis established a field laboratory and installed the cages of thirty guinea pigs, thirty mice, thirty white rats and thirty rabbits which he had brought from Washington.

A fifty-two year old rancher had been sick four days following a deer-fly bite on right of neck. Some blood was withdrawn from vein of arm which was injected into twenty-seven pigs and two rabbits, all animals were dead on fifth day.

The ranchman died on the twenty-sixth day. Autopsy was performed and the spleen was enlarged and studded over surface, and pulp with white spots 1 to 3 m.m. in diameter.

It was only five days after the rancher's death that Dr. Francis was stricken with chills, and rapidly developed a fever of 102.2. He was hastened to the Marine Hospital, and after two months was able to resume his studies.

Upon further investigation they set about to determine the role played by the deer-fly in transmission of disease.

They captured deer flies and allowed them to bite and suck blood of rabbit infected with *Bacterium Tularensis*. Then they let these flies feed upon healthy rabbits. Two days after these rabbits were dead. Autopsy found the same spotted spleen and liver.

During this investigation it was found that it was possible for this organism to penetrate the unbroken skin, and this was proven by the wife of the Japanese investigator, Dr. Ohara, in 1925 when she allowed herself to be inoculated by rubbing the serum and blood of a supposed diseased rabbit on the back of her hand. This was allowed to remain for twenty minutes after which it was washed with soap and water. For two days Madam Ohara complained of headache and tenderness of axilla. She was afterward confined to bed with general malaise, chilliness, arti-



cular pains, headache, constipation and numbness of extremities. The fever reached 103.5. Several lymphnodes were removed later from Axilla.

Some eight months afterward Dr. Fran found that the serum of Madam Ohara agglutinated *Bacterium Tularensis* proving without a doubt that she had acquired Tularemia as the result of her experiment.

When the investigators were in Dayton, Ohio they were amazed to discover that a score of market-men had known about the clinical manifestations of the disease for at least thirty years. Bitter experience had taught them to dread the rabbit season because of the certainty with which one or more of the meat-handlers in a given market acquired a prostrating illness which incapacitated them for months. They also knew that if a meat cutter once recovered from the disease he was free from further danger even though he might handle the same batch of rabbits from which some other butcher acquired the disease.

November of 1927 it was discovered that twenty-four Dayton people, seventeen of whom were market men, were ill of Tularemia. It was concluded that there must have been many unrecognized cases prior to this time. A circular letter was sent to all physicians of Dayton soliciting information regarding possible old cases. As a result six old cases were discovered, all among market men.

The permanence of the serum agglutination in Tularemia permits one to determine with certainty whether or not an individual has had the disease.

The disease is spread among wild rabbits through the agency of biting, blood-sucking flies, lice and ticks. The common lice and ticks are the most important transmitters. There is no record of the disease being acquired by eating of infected rabbit, as thorough cooking destroys the organism. There is also no record of a case being acquired from one individual to another.

It has been isolated from the ground squirrel, rats, mice, sheep, muskrats, opossum, woodchuck, monkey, gopher, porcupine, coyote and chipmunk. The horse, cow, dog, fox, hog, chicken and turkey do not appear to be susceptible to natural or experimental infection with *Bacterium Tularensis*. The house cat seems less susceptible than any other animal.

Among the game birds, the pigeon seems least susceptible, while the blue grouse, ruffed grouse, hungarian partridge, ringneck pheasant, and quail have been found to be infected and susceptible to inoculations.

Naturally infected human cases have been reported from District of Columbia and

every state in the Union, except New England States, Delaware, and Washington. Ohio reported the largest with 92. With New York the lowest of 2.

The inoculation period varies from one day to one week. The average being three and one-half days in a series of 259 cases. I have found all cases under my care to show symptoms on the third day.

The onset is sudden. It may occur while patient is asleep or in the midst of his work. It is frequently initiated with sharp chill without any other symptoms. Many times simulating LaGrippe. This chill will be followed by fever, sweats, severe headache, aching pains in back and extremities, vomiting and prostration and sometimes delirium. The prolonged convalescence is one of the most serious features of the disease in most cases. Usually the patient remains bedfast for ten days to two weeks. Upon being permitted to sit up or walk about the room the patient becomes aware of extreme weakness on the slightest exertion. Some have been incapacitated for work for a year as was the case of my brother, whom I am sure had the disease in 1922. Suppuration of the involved regional lymphnodes may occur many months or even a year after the acute phase of the disease.

Complications have been noted in a few cases such as appendicitis, pleurisy with effusion and pericardial effusion. There is no evidence that Tularemia is contagious. There being no record of the transmission of disease from man to man by direct contact or by the bite of insect which had previously bitten an infected human being. There is no record of a Doctor who has incised the suppuration glands who has acquired the disease.

As to pathology. The base of ulcer shows a rich cellular infiltration with mononuclear cells, predominating. Perivascular lymphocytic infiltration was especially noticeable at the margin of lesion.

It is important to observe that there was no evidence of acute purulent inflammatory process being more or less of that of a subacute infection granuloma.

A peculiarity which I have observed is that nothing you do or apply to the primary lesion is of any benefit in healing as you would get in other wounds. In the lymphnodes the characteristic lesions are focus of caseous necrosis. Because of the histologic similarity in the lesions of tularemia and tuberculosis many pathologists have confused the two granulomas. The serological studies of Tularemia in man have led to two outstanding discoveries. First is the permanence of serum agglutinations in long recovered cases. Second is the frequent cross ag-

glutination of the organisms of Undulant Fever by Tularemia sera.

It has been demonstrated that agglutinins are completely absent during the first week of the disease. It is therefore useless to collect blood specimens the first week. They appear in the serum sometime in the second week and by end of three to seven weeks they have reached their maximum.

Now as to diagnosis. The most important thing in diagnosis is to have the disease in mind. Its symptoms and signs are ordinarily so characteristic that it is not easily confused with other diseases. The important consideration is the history of contact with wild rodents such as wild rabbits, deer flies or wood ticks, followed by development of an indolent primary lesion, and persistent regional lymphnodes. Many cases have been diagnosed influenza or as of streptococcus etiology.

Many cases may simulate Typhoid until it is proven by repeated negative Widol reactions and positive agglutination of *Bacterium Tularense*.

Because of the cross agglutination with Undulant Fever it may be taken for the latter.

Now as to treatment. Prophylactic measures are of the greatest importance. These include the education of market men, hunters, ranchmen, farmers, and the lastly in general, as to the danger of infection and the manner in which it is acquired, by urging thorough cooking and those who handle wild rabbits, or infected laboratory animals should wear rubber gloves. Hunters should be particularly warned about handling wild rabbits found dead in fields. Wild rabbits which are easily caught or shot because of sluggish movement are very apt to have the disease.

There is yet no specific treatment. No vaccine or anti-serum has been found to be effective. Treatment is essentially symptomatic. Strict confinement to bed is important. No intravenous therapy has altered the course of the disease. In view of the fact that serum agglutinations are so permanent it seems logical to me that the disease might be arrested in acute stages by the use of immune human serum as that taken from individuals who have had Tularemia.

As said before I have found nothing to heal the lesion, yet you get some relief from the burning pain by hot compresses of some antiseptic solution. I have given Echinacea Fl. Ext. to saturation and thought I saw some marked improvement in condition.

To summarize the unique features of the disease.

1. The certainty of infection of laboratory workers.

2. The persistence of agglutinins in blood of long recovered cases.

3. The cross agglutinations of Undulant Fever with *Bacterium Tularense*.

4. The granulomatous character of the lesions in man.

5. Its penetration of the unbroken skin.

6. The slow convalescence.

7. The fact that one attack renders patient immune from other attacks.

8. Its hereditary transmission through egg of the tick to next generation of ticks.

9. The great variety of insect host.

10. The great variety of animal host.

#### THE PRESENT STATUS OF HEMOLYSIS IN BLOOD TRANSFUSION WITH REPORT OF A FATAL CASE\*

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Covington.

In June of 1667 Denys (1) of Montpelier, applied the treatment of blood transfusion to a young man who was weakened by repeated hemorrhages. The blood of a calf was injected and the man recovered. From this time of Pepys in the 17th century, the merits and safety of blood transfusion has been under discussion. And it is yet a question not sufficiently understood. In 1892 Maraglino (1) discovered that the serum of a healthy man was hemolytic to a serum alien to it. And in 1899 Shattuck (1) instituted typing of blood, followed in a short time by Landsteiner's report (2) on the same subject. Ottenberg (3) first used the micromacroscopical method in compatibility tests, which later was modified by Brem (4). Adopted methods which have proven adequate for a great period of time are rarely challenged until a terrible accident occurs. In the writer's experience, a modification of Brem's (4) method in that no known groups are used to determine whether a prospective donor's blood is suitable for the recipient, has proven efficacious with no bad result except a very occasional reaction, such as a slight fever, and in one case, a chill. The following is the report of a case that terminated fatally and gave rise to this resume of the subject.

G. G., a girl, age 27, while spending the night in the hospital prior to an impending tonsillectomy, developed an attack of pain in the abdomen. Eighteen hours later after the onset of the pain, on 5-21-31, she was operated upon for intestinal obstruction. Gangrene of the bowel had set in and a resection of the bowel was done. An end-to-end anastomosis was made but this proved in-

\*Read before the Campbell-Kenton County Medical Society



adequate, for it was followed by mild symptoms of obstruction, and therefore on 5-25-31 an enterostomy was performed. The patient seemed to be holding her own, but the improvement was not as rapid as was expected. A blood transfusion was decided upon, and by the direct method of cross agglutination with the donor's serum and the recipient's corpuscles and the recipient's serum and the donor's corpuscles, a suitable donor was chosen. 500 c. c. was given by the citrate method and the patient stood it well. The abdominal distention still continued in spite of the enterostomy and therefore on 6-8-31 a catheter was placed in the enterostomy. The patient seemed to improve and for two weeks made a slow but gradual gain for the better. Then symptoms of obstruction set in again and while not severe or alarming, upon consultation, reopening the abdomen was decided upon. This was done on 6-25-31, nineteen days after the first blood transfusion. Partial obstructions, due to the many adhesions were found and after separation and resection of a small part of the bowel followed by a lateral anastomosis, the patient was then given another blood transfusion. It must be stated here that all the operations with the exception of the third in which the tube was inserted were performed under spinal anesthesia. In the last operation the patient was in good condition, considering what she had gone through and at the end of the operation had good color, the pulse was strong and regular, and she was awake and talking to the doctors and nurses in a voice that was bordering on the vociferous. At this stage the second blood transfusion was instituted. The same direct cross agglutination method was used to find a suitable donor and the citrate method was used. The blood was given slowly and about 300 c. c. of blood had been given when it was noticed that the patient became quiet, and her skin pale. The patient was asked for any signs of headache, backache or dizziness, but she replied after a slowness of speech was discerned that she felt nothing except a little weakness. The transfusion was continued and after that 200 c. c. of normal saline was given, an often used procedure with beneficial results, to replace fluids lost by vomiting and decreased oral intake. At the end of the transfusion the patient seemed very quiet and then it was noted for the first time that her respiration was slow, 12 to the minute, and the skin had a slight icteric tinge. The skin still remained pale. No cyanosis was noted. The pulse was rapid and weak. She was brought back to her room; it seemed in a state of shock, with a weak pulse, slow respiration now reduced to 8 per minute. The jaundice seemed to be deepening. She

did not regain consciousness, and the dyspnea continued. She died 8 hours after the transfusion.

#### DISCUSSION

While it was indeed unfortunate that no blood work was done following the transfusion, it seems that what took place was a hemolysis of the recipient's blood, resulting in jaundice and air-hunger. In this case, questions arise, that to try and answer according to prevailing opinion leaves us yet in a bewildering quandary, as to what was the exact physiologic-pathological phenomenon.

What role did isohemolysins play in this picture? The probability of their presence must always be kept in mind. In 1901 Landsteiner (2) found that 22 individuals whose blood he studied could be divided into three groups with respect to isoagglutinins. It was found in other words, that analogous to the isolysins described by Erlich (5) and his workers in the case of goats, human beings could exert specific hemoagglutinating action, and in some cases, hemolytic action upon the corpuscles of other individuals. According to Hewlett (6), isohemolysins may occur naturally, and they account for some of the occasional accidents which have followed the direct transfusion of blood from one individual into another of the same species.

What part did a repeated blood transfusion have in the events that followed? According to French (7), it is noteworthy that if the same donor is used a second time hemoglobinuria may follow the second transfusion when none accompanied the first. While in the discussed case a different donor was used for the second transfusion yet we know that the type of an individual sometimes changes, though very seldom, after transfusion. According to Hewlett (6) isohemolytic substances may probably develop in certain instances after repeated injections. And DaCosta (1) states that true allergic reactions are more common if more than seven days are allowed to elapse between transfusions. Was this the possible explanation? A time of 19 days did elapse between the two transfusions. Were hemolysins formed due to the repeated transfusions or was it allergic in action with hemolysis resulting?

Was the test for compatibility adequate or must we look for other methods? When it is seen that additional blood groups exist according to Guthrie (8), the complexity of finding the right donor seems augmented. Blood grouping seems to be the paramount issue with some men, universal donors seem to be the answer with others, and yet others dare not trust a transfusion until a cross-agglutination test is carried out, regardless of grouping. Moss (9) feels that care must be

taken to secure a donor whose blood falls in the same group as that of the recipient, otherwise serious or even fatal hemolysis may occur in the recipient after transfusion. Irsigler (10) came to the conclusion that blood transfusions should be made only following careful determination of blood groups. Levine and Mabee (11) brought attention to the fact that universal donors are not always safe. DeCosta (1) denounces such a practice and believes that the universal ideas of universal donor and universal recipient are erroneous, and further believes that cross-agglutination should be done before each transfusion. Wildegans (12), in an exhaustive review of transfusion deaths states that it is best to reject the universal donor and employ a donor belonging to the same group as the recipient. However, as he further points out, even this does not always prevent accidents. An acute hemolytic crisis may occur immediately after the transfusion, a fatal delayed reaction from one to four hours later, or a constitutional reaction due to the foreign protein. Oehlecker (13) from a careful review of cases of hemolysis that were fatal following blood transfusions shows that hemolysis may occasionally supervene in spite of blood groups determination (and in spite of the direct test of a droplet of donor's blood in recipient's serum), under the following conditions: Rare exceptions or intermediate (?) groups in the four classical human blood groupings; uncertainties in the interpretation of the serological tests, especially by the inexperienced observers; changes and deterioration of the test sera; last not least, all sorts of confusions and misunderstandings in every day life.

Recognising that careful cross agglutination is the best method, the question arises, can hemolysis be foretold by such a simple test? Tice (3) states that hemolysis does not occur unless it has been preceded by agglutination. Hewlett (6) states that when hemolysis occurs, it is usually preceded or accompanied by agglutination. Wildegans (12) seems to feel that it is justifiable to doubt whether our confidence in the practical value of the theory of agglutination can continue. Direct study of the bloods has special advantages over the determination of blood groups, but it is doubtful whether agglutination always precedes hemolysis. Parr and Krishner (14) state that from their experience it does not always do so and in their fatal case, post-transfusal examination of the blood, demonstrated that the hemolysis was slow in vitro, although the donor's cells were involved in the hemolysis instead of the recipient's with which we are more concerned. Irsigler (10) studied transfusion deaths and he feels that the reported cases

prove, what has already been indicated by animal experiments, that agglutination and hemolysis, as reactions following mixtures of different types of blood, are not connected so closely as the agglutination tests indicate. In animal experiments the two phenomena can be produced independently of each other. From an agglutination test in vitro, one cannot infer either the actuality or the intensity of the agglutination or the development or absence of a hemolysis in vivo.

Despite the dire warning of hemolysis not being detected by the ordinary method of cross-agglutination, Blaine (15), in reporting his impressions resulting from 3000 transfusions of unmodified blood, feels that the method is adequate. He states, "In about one-third of the cases the patient and donor are not in the same group, and I can state positive that there is no objection to such a procedure. Such a practice does not increase the incidence of post-transfusal reactions. The donor's blood, even though it possesses the necessary agglutinins to clump the patient's cells, will not do so when added to the patient's circulation in the amounts ordinarily given. Theoretically it is possible, however to give enough blood from this donor to raise the agglutinating titre sufficiently high to cause a disturbance. Ordinarily it is only necessary that the patient's plasma does not agglutinate the donor's cell." Tice (3) endorses this only precaution by stating, "If the donor's serum agglutinates the patient's corpuscles but there is no agglutination of the donor's corpuscles by the recipient's serum, the transfusion may be safely done, even knowing that the donor is not in the same group." And Brines (16) is even more emphatic in a review of 4000 cases of transfusion. He states, "In a transfusion, as far as compatibility is concerned, the sole interest is that the plasma of the recipient does not agglutinate the cells of the donor. The exceptions to this are negligible. In the 4000 cases, incompatible blood was transfused 6 times. No fatalities occurred in 4 of these cases and 2 others were in a moribund condition before the transfusion."

#### CONCLUSIONS

While it seems quite evident that the phenomenon of hemolysis occurs in vitro without agglutination, and that agglutination in the ordinary methods of micromacroscopical examination do not accompany the phenomenon of hemolysis, yet one must come to the conclusion that to all intents and purposes the methods discussed of cross-agglutination are sufficient in compatibility tests. It is recognized that fatalities do occur in spite of these methods, yet one is struck by the fact that in almost all the cases, the deaths might have been avoided if more at-



tention had been given to striking initial symptoms at the time of the transfusion. And in addition, Oehlecker's conclusions need to be stressed. A survey of 7000 transfusions by American writers seem to justify the above conclusions.

Thanks is given to Dr. E. Northcutt for permission to present this case.

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**Benign Tumors of Bronchus.**—On the basis of a study of seventeen cases, Wessler and Rabin seek to define a clinical picture of benign tumors of the bronchus. Their study was concerned mainly with that form of tumor known as adenoma, which appears to be the commonest type encountered clinically. The following facts are emphasized: 1. Care must be exercised in the microscopic diagnosis of these tumors lest they be mistakenly regarded as malignant. 2. Benign tumors of the bronchus probably have a long period of latency during which there may be no symptoms of bronchial obstruction or bronchial irritation. 3. In a considerable percentage of the cases this period is characterized by repeated hemorrhages. 4. Aside from the symptoms of bronchial obstruction and infection, pulmonary hemorrhage is a frequent symptom of adenoma of the bronchus. This bleeding has certain characteristics which may suggest the diagnosis. 5. When stenosis of a bronchus with infection of a lung has occurred the clinical picture may be confusing. These clinical pictures are described. 6. The prognosis of benign tumors of the bronchus depends on the early discovery and removal of the tumor, which may lead to prompt cure. When secondary inflammatory changes have occurred in the lung, the outlook is not good. 7. Evidence is adduced which indicates that polypoid adenomas may undergo malignant degeneration.

## BRONCHO-PNEUMONIA

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Greenup.

Broncho-pneumonia is an inflammation of lobular or patchy areas of lung tissue, caused by microbic or other irritants that find their way into it through the bronchus. This of course, describes a lesion rather than a disease, it is found in the very young or very old and may be either primary or secondary; in the young, it may occur as an idiopathic affection though it is a frequent complication of the infectious fevers: measles, whooping cough, scarlet fever, diphtheria, smallpox, and etc. In aged adults it may occur during influenza, erysipelas, typhoid, in fact, any debilitating disease, including Bright's disease and the organic heart diseases, while it is rare, it sometimes complicates syphilis. The term aspiration or deglutition pneumonia is purposely omitted by the writer in this paper. Some of the other predisposing causes in the young are diarrhea and rickets, in fact, all influences depressing to life as overwork, fatigue, the air of badly ventilated houses, insufficient food and defects of hygiene, act similar. It is the writer's idea to discuss this condition as it affects children almost exclusively.

Holt in 1907, reported 426 cases as age predisposition as follows:

During 1st year	224 cases or.....	53%
During 2nd year	142 cases of.....	33%
During 3rd year	46 cases or.....	11%
During 4th year	10 cases or.....	2%
During 5th year	4 cases or.....	1%

After four years broncho-pneumonia is uncommon as a primary condition, though it is seen throughout childhood as a complication to the infectious diseases. Of these, males were more susceptible, the ratio being about 4:5. As to season 38% occurred during the winter months, 31% during the spring, 13% during the summer and 18% during the autumn. It of course, affects all classes, but is more frequent in children having poor hygienic surroundings. In 246 primary cases reported by Holt, 120 were in good condition before the attack and 126 were counted as delicate, rachitic or syphilitic. Now as to the number of primary as compared to the secondary, I copy the following table from Holt of the 443 cases reported.

Primary .....	164
Secondary to bronchitis of the large tubes .....	41
Complicating measles .....	89
Complicating pertussis .....	66

\*Read before the Greenup County Medical Society, December 11, 1931.

Complicating Diphtheria.....	47
Complicating Acute Ilio-colitis.....	19
Complicating Scarlet Fever.....	1
Complicating Influenza.....	6
Complicating Varicella .....	2
Complicating Erysipelas.....	2

The author says "A large number of the patients had previously suffered from one or more attacks of bronchitis and 15 previously had broncho-pneumonia as an exciting cause. Exposure to cold must still be classed as among the potent factors in primary broncho-pneumonia. In 1892, Netter published a report of 42 cases, he did not separate the primary and secondary cases. In 25 of these in which but one form of bacteria was found, the pneumococcus was found in 10, the streptococcus in 8, the staphylococcus in 5. The Friedlander Bacillus, in 2. In the 17 cases of mixed infection the streptococcus was present in 15, the pneumococcus in 9, the staphylococcus in 8, Freidlander's Bacillus in 4. Our present knowledge is as follows: The pneumococcus is present in most of them and in a large number of them, it occurs alone. In the mixed infections, it is more often associated with the streptococci, next to this the staphylococcus pyogenes aureus. In the secondary cases, a large part is played by the streptococcus pyogenes.

The term, bronchopneumonia, is now generally accepted as a generic one. The process may begin in the larger bronchial tubes and gradually extend to those of smaller calibre, finally involving the pulmonary lobules in which these tubes terminate or it may extend to the air vesicles which surround the tubes in its course through the lung, so that in any way the lung is cut, there is seen surrounding the small bronchi zones areas of pneumonia. In other cases the process seems to begin almost at the same time in the small bronchi and air vesicles. As both are found involved even when death occurs in a few hours after the first symptoms, there are however, cases in which the parts affected bear no relation to the bronchi, where these are found we find usually small or sometimes large patches or areas of pneumonia scattered irregularly throughout the lung, usually near the surface. From the distribution of the lesions such cases might better be termed lobular than bronchial pneumonia. The indicated foci are either areas of inflammatory consolidation or of atelectasis, when the lung is cut these pneumonia patches project slightly, above the surface and present a reddish in the later stages, a grayish appearance with occasionally a minute foci of suppuration.

As to the involvement, in 170 autopsies made by Holt 82% had extensive involvement in both lungs, the parts most affected were

the lower lobes posteriorly, next to this the posterior part of both the upper and lower lobes. The left lower lobe was more extensive than the right in over two-thirds of the cases. Only a single lobe was involved in but 9% of the cases. It is not common for the disease to be situated in the anterior portion of the lung, only, but when this does occur the right apex is the most frequent seat and in the primary form which is seen more often in infants and younger children. The symptoms resemble, in a great many instances, those of acute lobar pneumonia. The onset while generally more gradual may be very sudden with vomiting or less frequently a convulsion. The temperature generally rises rapidly to 103° F. or even 105° F. or in letherol cases as high as 106° F. might not be counted uncommon; then sometimes in debilitated children, the temperature may not go above 102° F. until death in three or four days. It has been the writer's experience to see some of these cases which may occur either in the primary or secondary form of the disease.

As to the mortality as compared to the temperature, perhaps Holt's table is about the average.

106° F. and over 55 cases with 47 deaths	85.5%
105° F. to 105½° F. 94 cases with 56 deaths	60%
104° F. to 104½° F. 53 cases with 26 deaths	49%
102° F. to 103½° F. 22 cases with 13 deaths	60%
99° F. to 101½° F. 7 cases with deaths	71%

These 231 cases did not include those complicating measles and diphtheria. Cases with steady high temperature 102½° F. to 105° usually do better than those with wide fluctuations 100 to 105. This probably is due to the fact that the former is usually caused by the pneumococci while the latter is usually the mixed infections. The temperature in any broncho pneumonia is usually of the remittent type. With this temperature which may continue high, the respiration and pulse are accelerated, the former often out of proportion to the latter, there is generally dyspnea, often marked with cyanosis, together with the nervous symptoms, restlessness, insomnia and delirium, but the physical symptoms are usually not so well developed as the signs would indicate. There may be no cough or one that is fruitful, this of course, in young children will be swallowed back and may or may not be vomited, the respiration is usually very much increased generally out of all proportion to the pulse. Sometimes as much as 60 to 70 times per minute. There are large dry and moist rales, almost through the entire course of the disease. These may be absent but when present as they usually are, they are at least one diagnostic point between lobar and lobular pneumonia. There may or may not be areas of consolidation, if so these



involve more often areas of both lungs, they are usually small and multiple, the pulse is very rapid as would be expected, it is weak and thready to compare with the severity of the condition. The cyanosis in severe cases is very marked. It has been the experience of the writer that there is a characteristic grunt with each inspiration, this tends to aid in the diagnosis. The gastro-intestinal symptoms when present are very distressing and render the prognosis grave, there may be vomiting or diarrhea, either or both. In fact, the diarrhea may be either a predisposing cause or a complication and is very grave as either. What is said of diarrhea may be said of tuberculosis, which may either be predisposing or a complication. When either the prognosis is almost always fatal. In secondary cases, the symptoms more often follow the predisposing disease, adding to these symptoms high fever, a weaker, faster pulse and the characteristic grunt spoken of above. The prognosis varies with the etiology but is always grave, being from 30% to 50% of all children affected with it.

In fatal cases death may occur in 24 hours or less. In secondary cases especially in rickitic or undernourished children the mortality in the writer's experience is exactly 100% in older children, two years or older that seem otherwise healthy, the mortality is expected to be about 80%. In this connection it must be recognized that some cases who have seemingly fatal symptoms recover while others whose symptoms point to recovery, die before the physician learns what it is all about. In the primary cases the mortality is expected to be somewhere from 10% to 30%. Holt reports the following:

	Cases	Deaths	% Mortality
Primary Broncho pneumonia	194	96	49.4%
Following Bronchitis.....	29	19	65.5%
Secondary to Measles.....	89	56	62.9%
Secondary to Pertussis.....	66	54	81.8%
Secondary to Influenza.....	6	1	16.6%
Secondary to Ileo colitis....	19	18	94.7%
Diphtheria, Scarlet Fever, Varicella, Erysipelas, all.....			100%
Making 461 cases, 202 deaths.....			65.5%

He reports the mortality as to age

	Cases	Mortality
1st year.....	202	66%
2nd year .....	102	55%
3rd year.....	33	33%
4th year.....	6	16%
5th year.....	3	

Nervous symptoms early in the disease do not affect the prognosis, three cases in which convulsions occurred in the onset, recovered, of 37 cases convulsions appearing late in the disease, all died save one. Broncho pneumonia causes more deaths in children under 2

years of age than any other one cause, save ileo colitis. Now as to treatment, there is no specific treatment, in other words, nothing can be done for the disease, much may be done for the patient, the uses of antitoxin and vaccines are certainly of doubtful value if not strictly useless. Open air treatment is certainly indicated from the beginning to the end. If the sick room may be chosen, it should be large and well ventilated with an open fireplace (this is an aid to ventilation). Ordinarily or under ordinary circumstances, the temperature should be maintained at about 70°F. though under conditions where much stimulation is needed and the patient bears it well, a much lower temperature would be best but the cold open air treatment as practiced by many physicians in the treatment of lobar pneumonia is to be condemned in broncho pneumonia. The diet should be almost exclusively liquid or semi-solid and liquid and of as high caloric value as the assimilation of the patient and all other conditions will warrant. Hydrotherapy may or may not be useful. Sometimes a cool bath where well borne, does a great deal of good in reducing temperature, stimulating circulation and quieting the nervous system, especially, if the temperature is 104½ or above. Sometimes counter irritation such as weak mustard applied to the chest, does a great deal of good, these certainly should not be strong enough to more than redden the skin. If they seem to be indicated and well borne, they may be kept on continuously, but the poultices of clay etc., used by the older practitioners are to be condemned. No patient with broncho-pneumonia should be required to lie on his back over a very long period of time. Small children may be nursed (held on the knee), much of the time. Old patients who are not too weak, may be permitted to sit up if they so desire. As a stimulant to respiration, strychnine may be used about 1/200 grain every 3 or 4 hours for a child one year old. If the patient is not too weak and the cough is too dry, stimulating expectorants, like ammonia chloride or carbonate may be used. If these are not well borne, by the stomach, the aromatic spirits of ammonia may be used. If there is circulatory failure, digitalis is indicated; if too acute nitroglycerine 1/500 min. every hour for a child one year old is to be recommended. The use of alcohol in broncho pneumonia is at present a very much debated question, Holt says it should be used in all secondary cases, especially those following pertussis, diphtheria, measles, etc. I think the recommendation of some of the authorities are like the old farmer who said, "Any thing is good for a sick calf, it would die anyway."

A REVIEW OF THE UNIVERSITY OF  
KENTUCKY BULLETIN STUDIES  
IN MEDICAL SERVICE\*

R. W. CONNOR, M.D.

Owensboro.

An alleged shortage of physicians in Kentucky is plainly a myth. According to statistical tabulation found in this bulletin (Page 55, Appendix No. 1) Kentucky rates 24th among states and possessions and the United States for some reason or other, had decidedly more doctors per capita than most European countries which do not have as heavy a mortality rate. This on the face of it does not argue well for an over supply of physicians. Each physician in this state has an average clientel of 879 individuals which is not large enough to yield him a financial return equal to a comfortable living and is 12.1% or one-eighth less than the number suggested by Dr. Rankin, and we doubt the practicability of his report. Most any physician can easily attend more than 1000 people and all active men do. We are of the opinion that the state as a whole is still oversupplied. We believe the state is not oversupplied as bad as some others and are indeed glad it is not oversupplied as bad as California. We have been aware of a political move for some time, to make a change in the status of affairs of the medical profession that would create another poverty stricken oversupply. We do not believe it best for the state to attempt to solve the economic problem of compensation of physicians in any locality, no matter how poor. There is no argument that an oversupply of physicians is desirable. We are of the opinion that the county officials could pay a physician to make pauper calls out of pauper fund cheaper and more satisfactory to all parties concerned than they could be supplied by the state or any state agency. A little financial stimulation by some of these county officials would go a long way toward locating a physician in some of these poorer counties.

It is barely possible that in some instances, money spent to pay local physicians for their work at their regular fee basis, would be better spent than on a full time health department. These sparsely settled counties do not have much of a public health problem. Certainly, the physician working for the county, should be treated as well as a day laborer and they do not get less when working for the county than other times. No other class of people are asked to give to the county poor but the physician. The groceries, clothing and coal furnished them by these counties are paid for by the county, but the

physician is expected to be furnished free or at the physicians own expense. We are of the opinion that the same is true of hospitals. The patient could be transported and his expenses payed by the county much more satisfactory and much cheaper than the hospitals could be built and maintained. We believe a hospital would be a white elephant on most poor counties hands, a political football and a pawn to further somebody's selfish ends, county or the board of health. We do not doubt that some places could be found, where a hospital is needed, but we do believe that local community enterprises, be it county, church or municipality, should build and maintain them. One plan would suit one place, while one of the others would work better in another. We believe that some counties might do well to furnish a medical scholarship to some willing local student in exchange for his bond to practice a given number of years in the county furnishing the scholarship. Such students would not be hard to find. He could repay the county with pauper calls. It would be well for the county to load on some of this charity business, because then maybe this mischief of pauperizing people amply able to maintain themselves would be stopped. The taxpayers would notice some of it. The people would soon see that it did not come so free as at first supposed. It might teach certain individuals that medical services have money value, a fact which some do not realize at present.

Behind all of this discussion may be found a small loud speaking minority element that are being shamefully (?) re-educated to pay for their medical services. Nothing is inadequate today about the medical service except, there is a noticeable shortage of poverty stricken physicians, forced by poverty, willing to attend these people for nothing or just whatever they care to pay him. Obviously, a thorough survey—one in which all factors entering into a medical service are carefully examined, is needed. One of these factors is the welfare of the rank and file of the practitioner of medicine, (the man that can do many things reasonably well) ask him and (if his pride and self respect will permit) he will tell you quickly where and why our medical service falls short and what can be done about it. He will tell you that a large number of our population will have to be re-educated to pay him. Why would he not be in a better position to know than anyone else? At any rate, why would he not be in a better position to know that a salaried physician like Dr. Chambers or a college professor like Dr. Lynn.

He surely knows his side of the question, that is, not to be denied, and he knows more

\*Read before the Daviess County Medical Society.



about his clientel than anyone else on earth. Listen to him and thus be insured that, whatever we do, we will do to him. It is the purpose of this review to **HELP** supply this information, not to offend anyone, but to be really frank in our statements. We believe that every physician licensed to practice should be reasonably well qualified to practice the healing art and he should have reasonable assurance that he will get a comfortable reward for his life long efforts to prevent, to relieve and correct human ills. Monetary reward and demand will continue to control the supply, like it or not, admit it or not, believe it or not, it always has and always will. The old period of physicians in number, did not move so fast and had more room as a result. His range was limited to about twenty miles a day. It took about five times as many at that rate of speed to give service to the same amount of territory as it does with the present rate of transportation and communication.

We do not believe that one fourth of the counties and one-seventh of the population of the state, are without even a decent medical service and may not even be available to services of the family physician. We believe the well meaning investigators who made this report forgot the increased accessibility of the modern physician with his telephone and cheap automobile. Today, by means of this cheap car and his telephone, he is as easy and as quickly accessible to his patients fifty miles away, as he was fifteen years back, at a mile's distance. He gets there quicker, cleaner, with less exposure to himself, and he is able to carry more diagnostic equipment and more remedial measures. He, in all ways, gives better personal service. He could not have many nurses, technicians or laboratories with only 879 patients per year to treat or about one patient every five days, but we do find that his friend wife, answers the telephone and possibly heads him off with another call to make before he gets back. This saves him a lot of mileage on the Ford and saves the client the trouble of running a horse to death to get the doctor. Some of us who are still in the age group of 40 to 44, have lived in both periods. We believe the University investigators were thinking in terms of ox-carts and "run for the doctor" days. It is also to be remembered that the average doctor with this average 879 clientel (and some larger) of this recent vintage, is able and does do most of his own laboratory work. He lives in pretty good towns where electricity and gas are available, where he can have some laboratory equipment and where he is more accessible to these rurals than he would be if he lived out with them. He takes their calls from all directions.

Any technical work that he cares to refer, is gladly taken care of by a nearby technician, who also takes the same from forty other colleagues. He seldom needs the services of a specialist because he does everything from appendectomies to cones pretty well himself. He can call a specialist 100 miles away when he does need one and have his services in less than three hours. He can transport his patient to a hospital nicely in a smooth running electrically heated ambulance 100 miles distance in another three hours. A nurse will be on the job anywhere she is needed in less time. She doesn't care how fast she rides with a case in sight. She doesn't charge mileage either and will stay as long as she is needed and like it. Now what is wrong with that for service? We do not meet opposition to this new-fangled expensive medical service after the family sees it work once or twice. They learn that it does not last so long, the patient suffers less and it is thereby often cheaper.

We readily agree that the state has (considering only total numbers) enough doctors. More than enough. Also, that they are not always the right kind, in the right place. We believe, if a preliminary educational requirement equally as high was put in chiropractors as that put on doctors of medicine, that there would be a noticeable falling off in the wrong kind and a little more incentive added to prospective students of the right kind. Our legislators might try something like that once instead of continually trying to legislate us out of a decent living. This right kind of physicians will continue to go where they think they can make a decent living, unless he is well rewarded to do otherwise. It would not be hard to get a new M. D. to any county or town if that county would say to him, "Doctor, our county pays about \$1500.00 each year for professional service to the poor." That would not amount to a tax burden even to a poor county but it would insure the young, financially deflated M. D. something like a meal ticket and a chance to pay that interest on the borrowed money he owes his relatives for his schooling.

If any county could not stand that expense when it needed a physician so bad, that county should be cut up and divided among the surrounding counties. That would cut out a few county officials and make the medical service possible. We do not agree that the older men are mostly rural, general practitioners. We do not know of a single specialist younger than forty-five, in this or none other counties, grouped around or nearby Daviess. We do know that most rural practitioners are older men but we believe there are other reasons for that. Many of them have been located so long in these ham-

lets that they would not care to leave even for greater financial remuneration. They have their friends, their customs, their clientel and their homes located there. They have a full knowledge of all of this and they have their clientel so well established that they do not care to leave it for whatever the difference would be, good or bad, the rest of their life. It is doubtful whether the best qualified physician that ever walked could go there, when this old practitioner passes into the great beyond and do a decent business. He certainly would not stem the tide of the drift to the motor equipped city practitioner as effectively as did his predecessor. We are positive many of them will not be replaced, because in many instances, the demand for the location was gone long before the life work of the likeable old physician was ended. The demand of the location yielded to the longer arm of quick communication and transportation as did the old saddle horse, the buckboard cart, the cross-roads grocery, the blacksmith shop, the village church and the little red school house. The old physician lasted the longest because he represented more than an institution, he was a part of life itself from the cradle to the grave.

The number of physicians in the state will in all probability, continue to decrease fifty per year or faster until the demand absorbs the present oversupply. In the meantime, the unreplaced loss will be mostly general practitioners in the rural communities because a specialist never could have been in demand there and was never there to be replaced; second, the demand for another general practitioner is now gone also because the range of accessibility of each individual physician has increased from three to five times. For these same reasons the apparent demand for rural practitioners does not exist.

It occurs to us that the modern method schools are turning out men of just the type that are called desirable. They are certainly able to specialize if they care to. The fact that some do enter specialties only means that they are often the only men in the community who have the training to specialize and that they are crowded in general practice. We do not share the opinion of the University investigators that our modern medical schools do not recognize the needs of the rural communities and we see nothing to warrant the opinion that modern medical education encourages narrow specialization for the exceptional students. We have a suspicion that some of this squawk about the shortage of rural and general practitioners arises largely from some specialists who are not called in consultation as often as they formerly were because the modern graduate

does much more of this work than his predecessors. It is true that the faculties of the medical services such as laboratories and hospitals have been provided by local community interest because that has been the demand. While it might or might not be the best policy, it is what demand has produced. The faculties of the public health service are provided jointly by the county and state and the public health service does some very effective work but the public health unit could not be called a specialty, popular among the rank and file physicians or the better class of laity, either. It must be remembered that the physician in general practice of medicine probably teaches more public health measures and carries out as many of them as the physician in the county unit does. He at least sees the contagious diseases first and reports them. He does not quarantine because he is not expected to, but he does give most of the instructions where these contagions exists, that prevent their spread. He occasionally vaccinates and immunizes a few and gets money for it, where the health department has not already beat him to it and does it for nothing. It is a mistake to give these county units credit for all of the public health measures in the counties where they exist. We are willing to agree that some time in the course of ten or twenty years, it will probably be necessary to increase the faculties for medical education in the state, but we do not believe there is anything to be alarmed at for some years yet. When this does happen, any school in the state of Kentucky that gives a decent medical education, will necessarily have to be located at Louisville, Kentucky for the simple reason that not enough clinical material can be found available at any other place in the state. Then the University of Louisville, a medical school already in operation with years of experience and with years of traditions behind it, will have to be considered. Either the University of Louisville, School of Medicine will have to become a medical department of the State University, a compromise will have to be effected in some way or the University of Louisville will have to go out of existence. The demands of medical education in this state will never again require more than one school. We do not believe it is given us to solve all of the problems of a changing medical service to a changing public but we do believe that we know that good roads will continue to be one of the vital factors for sometime to come yet. Another will be, to re-educate the people to pay for their medical service. It does not help to teach them to try to obtain them free.



## THE PERSONNEL OF MEDICAL SERVICE

## The Supply of Physicians

Kentucky with its one physician to every 879 people is not as badly oversupplied as 24 other states but there is no argument that an oversupply is desirable when one has the lower mortality rate in all of these countries with a shorter supply of physicians. Certainly, the medical situation in California could not be called desirable anywhere. The fact that Kentucky ranks exactly midway between the two extremes, is excellent proof that we are not far off. The fact that the Canal Zone with its one physician to its 274 people, has an extremely low death rate, means little when one considers that this is not a state or province but merely a Governmental reservation where a given proportion of its inhabitants have taken rather close physical examinations before they are allowed to go there. It probably does not rate better than any other Governmental reservation of its kind but the fact that there is one physician to every 274 people of this federal reservation and that there is only one physician to every 7,796 people in the Phillipines would make one suspect that even under federal supervision, physicians do manage to get located where living conditions are pleasanter. Not many tubercular patients were ever known to journey to the Canal Zone to recover. Is Kentucky under supplied or oversupplied with physicians? Our frank opinion is, that neither condition is very apparent. We do not know of any occasion where any person was allowed to unnecessarily suffer or lose their lives for any other reason but impassable roads. We quite agree that oversupply means excessive competition which vitiates true professional spirit and is productive of all kinds of evil except high fees. We deny that. Physicians, being human, are like everybody else in one respect, that is poverty is not conducive to high ideals or high standards of intrepidity. There are many factors which enter into this question but we have never yet found a physician who cared to go anywhere he could get in his car and a decent compensation for his trip. Put the roads under his Ford and he'll make the call anywhere he is paid anything that approaches a decent fee. It is a standing joke that a physician will often make a trip over a given distance for less money than a taxicab driver would charge.

It is also to be remembered when we compute a ratio of physicians to population, practically all of the specialists are located in the larger towns. By this I mean, a specialist who supplies all the community as well as all of the population of the town. The towns

also have their quota of general practitioners and the specialist to boot, which plays queer tricks on us when we care to make such estimate. It is a safe bet that if it required one physician 15 years ago to every 646 people, that it will only require one physician to every 1,938 today. When this is taken into consideration, that cause of the decline in the number of physicians is very apparent. The old law of supply and demand has not ceased to exist. The fact that more physicians are found in the wealthier counties proves conclusively that proper compensation has its weight in any locality. The fact that there are more physicians where roads are better only proves what we have already stated, that money alone is not everything and that good roads are still a great factor. It is highly probable that physicians will continue to decline in numbers in counties where roads are bad, for sometime to come. If this is the case, would it not be better to build good roads than to try to turn out a supply of physicians when two-thirds of them would undoubtedly be left without work when these roads are finished? In any county or community where all parts surrounding it are well supplied with physicians, is it not a safe bet to assume without knowing, that there are some very undesirable situations there? If this is true, then will not this community have to change its ways? We admit that there could be locations where a person might suffer unnecessarily or die before the services of a physician could be secured because it would only require one mile of impassable roads to create a situation like that. With the trunk line roads all finished, with the community and county roads finished, if these same farmers still live back muddy lanes from a quarter to a half mile long, will it still not be possible for him to take sick and die before a physician can wade across in the mud up to his neck? If there are situations like this, might we ask who is to blame? If physicians do not like these conditions, can you blame him for it? It would be well for our welfare organizations to spread a propaganda of "Fix up your community roads and private lanes."

## THE SUPPLY OF NURSES

Since all parties agree that the supply of nurses in the state is adequate for present needs, this phase of the medical service of the state will be treated briefly. At the same time, one wonders just what new problems would arise from this angle should the state suddenly decide to load on 125 state maintained county hospitals. This number of hospitals would certainly require a goodly number of our trained nurses, or these same hospitals would be doomed to become dirt holes

and death traps. This personnel of nurses would certainly demand a sizable payroll in case the state used only graduates and what would be the absorption for the services of nurses should all of these hospitals maintain training schools? That would be a man-sized problem alone.

#### THE SUPPLY OF TECHNICIANS

Any graduate of the Modern Medical School is well qualified to take on or perform the services of a technician. It is true that specialists on this work are few. It is equally true that the scope of their services is narrow because the average physician, who has graduated since the year of 1910 is doing practically all of his own laboratory work. The remaining residue of his work is not sufficiently remunerative to employ very many more in the state than are already in the field.

#### CONCLUSION: CAUSES

Our study of the personnel of Medical Services in Kentucky together with our experience as practitioners, has led to two conclusions: first, the state is facing a shortage of physicians willing to work for nothing, second, it is highly probable that not many young men will be found who can be persuaded to study medicine and then locate in a county or rural community where the cards appear to be stacked for him to plough through mud all of his life and not have a word to say about the financial returns for doing it. The slight increase in the number of medical students of late only means that some of these sections are beginning to find out what it takes to procure the services of a physician and are paying better. It hurts some of them but they are doing it. After a time, the pain will not be so great. The loss in numbers will compensate according to demand. The physician who is fool enough to work hard all of his life and die on the charity of his family and friends has permanently gone the way of the Dodo.

The problem is essentially one of money and roads. After these factors are considered, the rest will take care of itself. "How can a large number of medical recruits be provided for the country and small towns?" They can't be provided. If, to supply service in these small towns requires that the physicians be located there, no man with guts enough to go through a course in medicine, will ever be willing to go out there and set down to rust, not even in a nice, soft spot with a good salary paid by the state. He will locate in one of the best towns in the five or six and do the work of all of them with the country between, thrown in. He will do it better in every way, but he will collect better. He will probably pay his own

debts better also. He is going to be rather independent and bossy at times. There will be a few sections where the last frontier is not yet, where a physician cannot be had on a minute's notice. But pioneers have always understood their contracts. Certainly, every one of them don't expect to have a private personal physician and that is what it would take to give them "a decent medical service."

We believe,

That no real shortage of physicians exists.

That supply and demand will take care of any existing error of distribution.

That while not more than five counties could stand the tax burden of a county hospital and all could afford to pay for a few pauper calls and a few pauper hospital bills.

That a county health unit and a county hospital would be virtually state medicine.

That these health units should be subservient to the will of the local medical societies in all cases.

That any hospital can well serve the needs of a radius of a hundred miles.

That some counties would do well to increase their pauper medical expenditure and decrease amount of money spent on public health units.

We see no reason for decentralizing hospital patronage. It is as logical to decentralize the State Universities and the Consolidated Schools.

#### Relationship of Vitamin B to Metabolism.—

Himwich and his associates determined the time required for development of the anorexia characteristic of vitamin B deficiency, and the amount of food ingested during the period of voluntary food intake in four dogs under "normal" or basal conditions and during experimental hyperthyroidism. It was found that during hyperthyroidism (1) anorexia appeared in from one half to two thirds of the time required during the control period; and (2) the quantity of food ingested voluntarily per day was correspondingly increased. The total caloric intake for the two experimental periods were approximately the same. This suggests that a definite relationship exists between a given amount of vitamin B and the catabolism of a definite quantity of foodstuffs. The four animals successfully maintained their weights by voluntary ingestion of food only when receiving sufficient amounts of vitamin B.



AN UNUSUAL URINARY OBSTRUCTION  
WITH CASE REPORT\*

S. C. McCoy, M. D.

Louisville.

The case I shall report, as the program indicates, is one of unusual urinary obstruction.

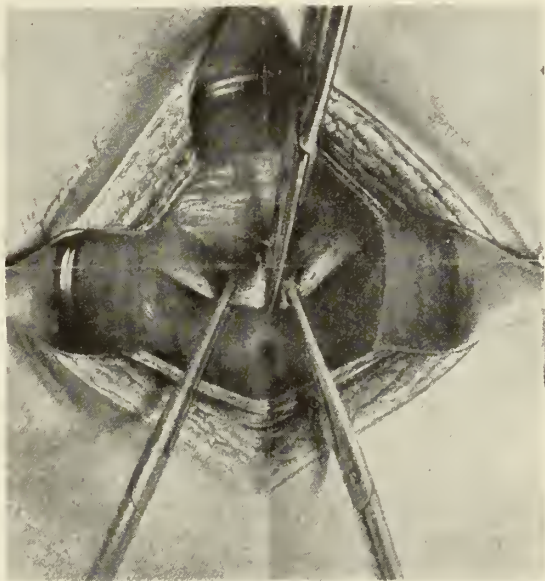
Patient is a white male 59 years of age. Is single. Patient came under my observation October 21, 1931, with a diagnosis of complete urinary retention.

History. Family history contains nothing bearing upon patient's present condition. His personal history, gives history of gonorrheal infection at age of twenty-three, and syphilis at the age of twenty-seven. Patient had been operated for enlarged suppurative gland in the left groin, when he was twenty-seven years of age. States that he has noticed a urinary disturbance since childhood, which was manifested by gradual lessening of the urinary stream. He also states that this stream was made smaller by effort in straining to void. For the past three years he has had complete retention of urine at intervals, requiring frequent catheterization for emptying of the bladder. During the last year, catheterization has been employed almost entirely.

Physical Examination. Upon rectal examination, the prostate gland was found to be normal in size and contour; rectum and anus normal except for slight relaxation of the anal sphincter. The external genitalia was negative; no sears. A No. 24 soft rubber catheter inserted into the bladder meets no resistance; the bladder is emptied of 1100 c. c. of reddish-brown urine containing much mucus and pus. Blood and spinal Wassermann are negative.

Cystoscopy. Upon obtaining the results of this examination, and finding no enlargement of the prostatic gland, nor any urethral obstruction to the catheter, patient was given a cystoscopic examination on October 31, 1931, with the following results: Without anesthesia, a No. 24 Brown-Buerger, convex, double-catheterizing cystoscope was inserted into the bladder. About 2000 c. c. of reddish-brown urine were withdrawn through the cystoscope; the bladder was washed with 4% boric acid solution until the return flow was clear. Then 500 c. c. of the same solution were left in the bladder. The bladder mucous membrane appeared markedly injected throughout and the lateral and posterior walls appeared trabeculated. There were no true diverticula present and no new growths were visualized. The ureteral ridges were considerably enlarged; the interureteric ridge appeared hypertrophied as well as the

trigone. This mass and the loose attachment of the trigone to the bladder floor, accompanied by the action of Bell's muscle, caused displacement of the trigone and thereby



Young's Operation for Splitting the Trigonal Muscle. Note how detached it is from the floor of the bladder.

caused this unusual urinary obstruction at the internal sphincter.

Following cystoscopy, patient was treated by leaving a retention catheter in the bladder until November 17, 1931, the date of suprapubic cystostomy. This suprapubic cystostomy was carried out according to the technique of Young and Wesson, as reported in the Archives of Surgery, July, 1921, and as reported in the Journal of Urology, October, 1931, by Dr. Thomas N. Hepburn, Hartford, Conn., in his article "Mobility of Trigone a Cause of Bladder Obstruction,"—the diagrams used in this article, having been borrowed from the latter.

Post-operative Treatment. The post-operative treatment of this patient consisted of draining by Pezzer catheter through suprapubic wound, for the first twelve days; the Pezzer catheter was then removed and replaced by a retention catheter in the bladder. At this time, treatment consists of urethral dilatation at five-day intervals.

## DISCUSSION

James R. Stites: I enjoyed Dr. McCoy's case report very much. This is fortunately a rather unusual type of obstruction, but it is seen occasionally. Usually, associated with this type of obstruction is also more or less atony of the bladder muscles.

The type of operation which Dr. McCoy describes, has been successful in a great many cases, but I believe that experience has shown

\*Read before the Jefferson County Medical Society.

that it takes a long time and constant drainage by an in-dwelling urethral catheter to give the bladder muscles a chance to regain their tone. Usually, these cases require treatment for many years. These patients have an enormous bladder capacity, as did the case Dr. McCoy reported.

I trust that Dr. McCoy will get excellent results on this case. However, it is extremely difficult to differentiate these cases from the so-called tabetic bladders. Also frequently one gets a negative spinal Wassermann and even a negative blood Wassermann in bladder tabes. This type is not the easiest to diagnose by cystoscopic means; and as Dr. McCoy says, in withdrawing the cystoscope the bladder itself looks fairly clean except for many trabeculations, thickening of the interureteric ridge and an area of darkness obstructs the usual field of vision of the bladder neck, which is more or less relaxed and enlarged.

This is a very interesting subject, and as I said we do not see many of these cases.

**S. C. McCoy**, (in closing): I believe that displacement of the trigone causes urinary obstruction in rare cases, that this affection can be clearly demonstrated by careful history taking, physical and cystoscopic examination; and that cure may be anticipated under the operative technique of Young and Wesson, as reported in the Archives of Surgery, July 1921 and illustrated by Dr. Thomas N. Hepburn in the Journal of Urology, October, 1931.

**Suprarenal Cortical Hormone and Respiratory Metabolism.**—Webster and his associates made an attempt to determine the role of the suprarenal cortex in the regulation of respiratory metabolism. Following bilateral suprarenalectomy in cats, there was a maximum fall of approximately 50 per cent in metabolism. The administration of suprarenal cortical hormone to these animals caused the respiratory metabolism to return to normal in from twenty-four to forty-eight hours. This change occurred also in animals which had been subjected to total thyroidectomy prior to the beginning of the experiment. Subcutaneous injection of large amounts of suprarenal cortical hormone was not found to affect the respiratory metabolism of normal cats or rabbits. Similar quantities of the hormone, when injected into the thyroidectomized cats, caused an increase in metabolism of from 15 to 30 per cent in 80 per cent of the cases. It would appear that the suprarenal cortical hormone exerts an influence, either direct or indirect, on the mechanism of respiratory metabolism and that this effect can occur independently of the thyroid.

## SOME PROFESSIONAL PROBLEMS\*

AUSTIN BELL, M. D.

Hopkinsville.

Kentuckians have always been proud of their native State and well may they be, for in every field of activity her sons and daughters have proven valiant leaders. The history of the legal profession would lose much of its luster should the names of Kentuckians be stricken from its pages. American statesmanship would be far from complete without a roster of Kentucky's brilliant sons, who have taken first rank on every hand. And so in every walk of life, our grand old State has brought to the front leaders, who have helped to do work of a worth while and lasting type. In Medicine and Surgery, we take just pride in the leadership which has brought our own profession to the present high state of development and placed Kentucky doctors in the forefront of the Nation.

In natural resources, our State is second to none, yet can we be satisfied with our accomplishments in developing our God-given opportunities? Those who have gone before, have left us a rich heritage, and it is ours to profit by their example and meet the problems that confront us with the same spirit of fairness and determination exhibited by those, who have made the brilliant history of our Commonwealth.

We might pause and ask ourselves the questions: Have we done the best possible to develop our resources? Are we putting forth every effort to make our State take first rank in the Nation? Is it our ambition to produce the highest type citizenship possible, within our borders, and make for ourselves and those who follow after, cities, towns, villages and rural communities the ideals of the Nation? It is high time that we survey our present condition and realize the many things lacking to accomplish these aims.

The medical profession of the nation has many problems to face and Kentucky doctors must do their duty in solving things peculiar to us as a people. For many years those who think, have recognized the fact that medical service to our population as a whole lacked much of meeting public demand, and more recently conditions in many sections have become intolerable. The University of Kentucky, in a recent publication, presents a survey of this most important question, and gives facts which are incontrovertible, both as to our present status and the future developments, unless constructive thought and effort are utilized to correct the evils

\*Read before the Christian County Medical Society.



that exist. When one-fourth of the Counties of the State, and one-seventh of the people, are without decent medical service it is high time for our profession to take stock and offer relief. The annual decrease of fifty physicians a year, especially when the unreplaced loss is of general practitioners, in those localities where their need is greatest, and the accessions are largely specialists and in the cities, already abundantly supplied, graphically stresses the public need.

The organized medical profession of the State must face conditions squarely, and boldly chart a course for the future, which will correct existing inequalities. The above mentioned survey clearly proves that many things contribute to the present inadequate distribution of physicians, if not to an actual shortage. The grading of medical schools by a commission of the American Medical Association, undoubtedly was the beginning of the movement toward limiting the number of graduates each year. The States licensing boards almost automatically refused license to graduates of sub-standard schools, which resulted in a laudable effort on every hand to raise those standards, and in consequence, colleges unable to meet the requirements were speedily closed.

In 1906 Kentucky had six medical schools, some of which had low standards, and many poorly equipped physicians were graduated each year. Her needs were more than supplied from this number, many of whom had poor preliminary educational advantages and lacked in native ability, while others, in spite of their unfortunate early medical training, by reason of good mentality, dint of energy and enthusiasm, and through the influence and stimulus of the brilliant teachers found in each school, have justly attained positions of prominence.

By 1910 all other medical schools in Kentucky had closed, or consolidated, leaving the present University of Louisville, which today ranks with the best in the nation but graduates a limited number each year, which would not supply Kentucky's replacement needs, should all the graduates locate within her borders. The readjustments leading to higher standards, not only required a pre-medical preparation far exceeding that of the past, but extended to four years the time required to take a medical degree. Even then, men of ambition, realized the importance of hospital training and few were willing to assume the responsibilities of practice, without one or more years devoted to this type preparation.

Can we censure the graduate of today, who has spent seven long and busy years in a technical education, before securing his degree, then enjoyed the privileges of a

splendid hospital course, from locating in a city when ready to assume the responsibilities of his profession? Without hospital facilities, in which is included the technical aids to his work, he feels completely lost and realizes his inability to render the best service. The economic phase of the situation must be considered, to properly evaluate conditions. On emerging from the hospital, the average young man has spent, or had spent on him, many thousands of dollars and is often seemingly, hopelessly in debt, and feels the necessity of locating where the income will be sufficient to meet his necessary expenses, rather than go deeper in debt for equipment. Often he assumes a salaried position, which enables him to become self supporting. Those who have experienced a country work in Kentucky, know that the income for the first year is little, for in most rural communities doctor's bills are the last ones paid and are usually met the following year. If at the end of three years his collections have netted him enough to meet the expenses for that time, he has done well. The second year's collection should off-set that year's expenses, and if the third year, the income exceeds the expense by enough to repay the loss sustained the first year the average has been more than met. Of course this is contingent on seasonable weather, abundant crops and lucrative prices when sold, a triad rarely found in rural Kentucky. This same survey stresses the road situation existing in most counties, as well as the poor schools, weak churches and decadent community life. Compare, if you please, the present planters with those of the past. Depressed financial conditions and deplorable indebtedness of the farming class has resulted in an exodus of the better educated and more highly cultured, to the towns and cities and left in their places many whose ambitions are less keen and whose desires are more easily gratified. Do we wonder then that the young doctor of this day refuses to face the hardships of a rural work? What doctor, who has experienced such a life, would advise his son to assume a country practice? Where is there a doctor's wife who would willingly have her daughter assume the burdens of a country doctor's home and rear a family under such adverse conditions? Could such community life make an appeal to a physician, who for seven years or more, has seen the better side of that profession? His life is hard and his hours are long! Those months that permit good roads will see him speedily complete his calls in an automobile, but the bad roads in rural Kentucky will necessitate a horse and buggy for winter use and wet weather, while at times a saddle horse and saddle pockets will be required.

Kentucky must have good roads to encourage the young doctor's interest, which demands a sane distribution of the road funds in developing all the cross roads of the county. It is imperative that a portion of the gasoline tax be spent within the county and this should be done scientifically and systematically under skilled supervision, until every road is made one for all year travel. The doctor who rides horse-back all day, or travels many miles in a buggy, with the loss of sleep entailed by obstetrics and ill patients, has little time to study and continue proficient and none for his family.

Community life must have proper consideration where the church, the schools and neighborhood meetings of various kinds are encouraged. The community hospital must be a most important factor in this improved regime. Not necessarily a county hospital, for neighboring counties, when small and sparsely settled, may be served by the same hospital. Distance and good roads are the determining factors in their locations. These hospitals must be encouraged in every way and the people served must feel a sense of responsibility for their upkeep and conduct. The Survey says truly:

"The general hospital is an institution designed primarily for community service and the responsibility for its establishment and operation should be borne by such local community."

In 1928, Kentucky stood seventh from bottom of lists in rank as to number of beds per population, i. e. one bed for each 502 while the average in United States was 1 to each 270 persons. Training schools are essential to the economical and wise management of these institutions, which are to fulfill local demands, and to train nurses that will serve such communities in caring for the sick and helping to relieve the overworked doctor. The high ideals of the nurses organizations are most commendable in developing trained nurses of a highly specialized type, but are they practical for the needs of rural Kentucky, and are they conducive to the best interests of the people as a whole? This most zealous body has lost sight of the sick and the needs in the home in trying to elevate the nurse's profession into a scientific rather than a practical one. The hue and cry in their journals today is against the over-production of nurses, and the number that are idle, while many communities are sadly in need of nurses and the hospitals of those communities could train young women to meet that need.

Through the influence of the College of Surgeons and its committee on Hospital Standardization, impossible hardships are placed on the small hospitals and expendi-

tures are called for beyond their ability to meet. The grading committee of Nursing Schools in its first report made the following recommendations i. e. "The Nurses' Home should be a modern, fire-proof building detached or semi-detached from the hospital and used exclusively for nurses. It should provide such accommodations and facilities as are most conducive to the hospital, social and educational welfare of the nurse. This presupposes individual rooms with running water, proper air, light and furnishings, recreational, library and study rooms, and unless provided elsewhere, adequate educational facilities, including class and demonstration rooms and laboratories. It is also desirable to provide special accommodations for the nursing and teaching staff when they live in the home." These ideals are lofty and probably can be met with advantage in the large city hospital, and especially where the cost seems not to be considered. Is this true elsewhere? Ask any one who has had experience in directing the affairs of a small hospital on limited capital! At times it almost seems that the elimination of the small hospital is the thing sought and certainly the exaction of hours of theoretical teaching of the nurses and the necessity of affiliation with the city training school, adds little, if any, to the qualification of that nurse to efficient care for the sick of the community. Surely the community hospital should be allowed to have a training school and make efficient nurses, who best fulfill the needs of that locality, and not be required to send those in training to the city hospital for special work along lines, in many instances, which will never prove beneficial. Too, they are taken from us after a certain training has been given—the very time their services are worth most to the local hospital—and utilized in city hospitals at a time their services are most helpful to them. This requires a surplus of nurses on the part of the small hospital, but enables the city hospital to lessen its number and consequent expense.

So long as the nursing profession can say to the small hospital, "You will not be permitted to have a training school of any type unless you subscribe to our ideals," and as an organization can lobby and put through such legislation as to give to them such authority, just that long will rural Kentucky be retarded in her development and be prevented from having her citizenship secure adequate medical and surgical attention, for in such accomplishments the small hospital is a necessary factor, and due consideration must be given the financial status requisite to the proper functioning of such institutions.

Another quotation from the Committee on



### Grading Nurses Schools:

"1. The Committee on the Grading of Nurses Schools disapproves of assigning any student nurse on special duty unless the assignment has educational value to her.

2. The committee disapproves of hospitals charging patients for specialising by undergraduate nurses.

3. When students are assigned to special duty as a carefully planned part of their educational experience, the student should not be on the case for more than eight hours out of the twenty-four.

4. Relief should be provided so that she can attend classes as usual.

5. When the condition of the patient, or the amount of experience already gained, produces a situation where the educational value of the experience is lost, the student should be immediately withdrawn."

Again I ask, is not the care of the sick and unfortunates of our community, the primary reason for the existence of doctors, nurses and hospitals within its confines? The refinements of the modern training school may furnish to the State, a limited number of nurses, who are a credit to any community in their technical and theoretical knowledge, but does that training enable them to better relieve suffering humanity or change the economic status of the community, for sickness is in reality an economic problem. Every respect is accorded the ambitious nurse who is not satisfied with ordinary accomplishments, and institutions should be and are available, where her desires and talents may receive just recognition. Hospital superintendents and those in positions of authority will come from this class, but this same high standard for every graduate will destroy the usefulness of the nursing class. Already, in rural localities, as well as the cities, untrained nurses and those with very little training, are caring for much of the sickness. The complaint is often heard when a trained nurse is suggested—"They require too much waiting on," and too often those words are prophetic of actual conditions, when a city nurse is secured for the small town or country. In passing, it might be mentioned that many of them refuse to accept a call in such localities, else ask the type home and the conveniences to be found in that home. We, too, as physicians, have many calls that we would prefer not making but we know that all are in need of professional attention, and there are indeed few who do not secure it where doctors are available.

This grading report further says:

"Nursing education can only proceed effectively when there is a general supply of graduate nurses to care for patients, at times when the student must be attending

classes or transferred to other services for educational reasons, and offers the suggestion, that adequate graduate floor nurses should be in every hospital to accomplish the above." Again the following statement is found: "If schools of nursing are to be free to assign students where they will learn most, instead of where they will be most useful, the hospital must supply graduate floor nurses to carry the extra load."

It is stated, "that every school should have one person whose major responsibility is teaching. Nor can any instructor be expected to teach a large number of subjects and do adequate work." These suggestions are in the interest of the nurses who have graduated, for the exactions will necessarily lessen the number of Training Schools and thereby graduate fewer nurses, which would seem to make the demand for the graduate nurse greater, but a consideration of the other side of the picture is wise. Does that course tend to increase the number of small hospitals or does it jeopardize the existence of those now operating by the additional expense? Will those communities in dire need of doctors, nurses and hospitals be helped or hindered by such exaction? The burning question might be raised as to the influence on the urban situation in a relaxation of these requirements. Already they are amply supplied with doctors, nurses and hospitals and they may wisely elevate their standards, but does this justify universal hospital and training school requirements, which practically preclude the existence of the small institutions, so universally needed. The Survey's deduction that the small hospital with modern technical equipment is essential in interesting "a first rate physician of modern training" in a location is absolutely true. The further statement "there is a large degree of correlation between hospital shortage and physician shortage; the two tending to go together," is undeniable, which suggests "a comprehensive, consistent program of hospital building as a factor of prime importance in the solution of the problem of physician shortage" to which might be also added a sane and practical training course to supply nurses for that community and not to fill positions requiring advanced knowledge.

With good roads permitting automobile travel at all times, adequate hospital facilities and a community conscience, recognizing its obligation to all the people, much can be done to relieve the sick. Philanthropy is practically helping in these problems as evidenced by the Commonwealth and Duke Endowment Funds each of which is forwarding construction and maintenance of hospitals at strategic points, which may stimulate other communities similarly. It has been truly said that the

physicians, technicians and nurses take the place occupied a generation ago by the family doctor.

It is distressing to contemplate "that one-fourth of the counties of the state and one-seventh of the people are without an even decent Medical Service," and that those communities where the shortage is the most acute, if containing any physicians, will be for the most part older men, whose places will not be refilled as time takes its toll. The reduction in physicians in the State in the period from 1914—when there were 3,621 to 1929—when there were only 2,904, while the increase in population was from 2,340,000 to 2,600,000, which reduction is in the rural section, and the further fact that thirty-one counties in Kentucky are already acutely under supplied, with the prospect of a greater physician shortage on account of the ages of the doctors—shows indeed a sad picture.

Dr. Rankin of the Duke Endowment has estimated that with the fullest technical equipment one physician can efficiently care for a population of one thousand. The Kentucky Survey showed one physician to every 879 people on the average—varying in different localities from 1 to 281 in Lexington to 1 in 7,705 in Elliott County. Twenty-one counties show a ratio of one doctor to every 2,000 or more. The Survey counts as one-half active, doctors over sixty years of age and under such rating thirty-one counties give a physician—population of 1 to 2,000. With a population of one and one-half times that of Louisville in those thirty-one counties—there are only 202 doctors to Louisville's 660—69% of the former are over fifty years of age and 34% over sixty. This is in itself a cause of alarm considering the changes certain to occur in the next few years. All this data stresses the urgent need of considering every influencing factor in a discussion of the solution of medical service.

State medicine is the menace staring us in the face, the greatest possible evil, both for the people generally and the medical profession, and only the latter can forestall its advent. The suggestion is often made, "that already we have the entering wedge and that the State Board of Health is working to that end." Such is not my conviction. The County Health Unit, the establishment of which is so strongly urged by that body, may be used wisely or unwisely and prove a great blessing or the direct calamity to the future of the commonwealth and the medical profession. General Cumming of U. S. Public Health Service in commenting on the rapid strides and marked progress in health work in the Southern States makes the further suggestion, "it is my earnest wish that I may be privileged to see the day when an even

greater record is set; when every county, or like sub-division, in every State will have its Fulltime Health Department."

President Hoover in a recent address said, "The organization of preventive measures and health education, in its personal application, is the province of public health service. Such organizations should be as universal as public education. Its support is a proper burden on the tax payer. It cannot be organized with success either in its sanitary or educational phases, except under public authority. In its practical working out of organization, exhaustive experiment and trial have demonstrated that the base should be competent organization of the municipality, county or other local health unit." Great care should be taken in the selection of those physicians in each county that comprise its health board, for those three men have absolute control of all the appointees of the Unit, as well as regulating and limiting the work to be done by that unit. The health officer should be selected with due consideration, for the future usefulness of the unit is dependent on his capacity, judgment, discretion and tact. Without the last, his future is doomed and often the unit, for that alone will enable him to solve the problems connected with the home and sick, in harmony with the ideals of the practicing physician. Much of his work should be educational, arousing the public conscience to preventive medicine and measures of every nature that tends to prevent disease. Inspection of the schools and hygienic instructions of every type are included in his duties. The superficial examination of the school children is within his province but the administration of sera and vaccination of school children should be done for the indigent only, except in the presence of a serious epidemic, and then the counsel of the organized profession should be sought and its influence and aid will ever be forth-coming. Infections and deformities that need correction should be referred to the attention of the teacher, who in turn should acquaint the parents with existing conditions and advise medical or surgical help. Under no circumstances is he justified in holding a clinic where wholesale special operations are done by imported surgeons. Only the charity cases should be taken care of by the unit and then the local physicians should be sought and utilized. The co-operation of the local profession is absolutely essential in a wise and successful administration of the unit, and failure to recognize this fact, destroys its usefulness at once, and brings into disrepute agencies that might be productive of the greatest good to the community. Surely the educational value of such an organization in a community,



urgently in need of doctors would lessen sickness and improve the health of the sections. Epidemics should be investigated, the sources of the diseases sought, all dangers of contagion explained and prevention instituted. There are so many duties legitimate to a proper functioning board that it seems tragic that a tactless and unsuited officer should destroy the potentialities of his work by engaging in those things beyond his scope. Our State Board of Health should recommend only those who are equipped for the work, and native ability and sound common sense are more essential than theoretical training. If unfortunate selection is made, the sooner remedied the better, else that unit's failure will react against installation in adjacent counties. His instructions by the State Board should be explicit and his limitation should be explained, for when the health officer has once encroached on forbidden ground, others beside the one unjustly treated will take notice and permanent harm will ensue.

Lukewarmness on the part of the profession and often actual hostility to the proposed Unit, is engendered, by lack of judgment from the neighboring health officer or a failure on his part to recognize the limitations of his duties. It is no more within his province to practice medicine than it is the duty of the State to enter the mercantile or other fields of labor to compete with those who have embraced that line as a livelihood.

The medical profession is jealous of its rights and justly so, and its members will and should resent with fervor any unfair discrimination or unwise legislation, and those in authority to correct the evil of inequitable distribution of medical service must not embrace the greater evil of State medicine as a remedy or entertain ideas which will tend toward such development.

The medical profession of Kentucky should dominate the activities and direct the course in protecting the health of all the people. Individual prejudice and petty jealousies should be subordinated to the public good, else those unqualified to lead will resort to unwise legislation and ill advised measures, in a vain effort to correct conditions, and the evils of State medicine will result from the professions inability, or unwillingness, to lend its influence to helpful measures, fearing as many do, the selection of unsuited health officers. Would not the wise policy be the acceptance of our responsibilities, the safeguarding of the public and the profession—for their interests are identical—and through co-operation and constructive suggestions develop a health board which will prove helpful to all alike.

The Kentucky Survey states "the essential

problem rests, not in keeping the ratio of the entire state above one physician to every thousand people but in bringing every part of the State up to that level." To accomplish this, recruits must come to rural communities in greater numbers and the suggestion is often made that more medical schools will help solve the problem.

Criticism of the drift toward specialization is frequently heard, which comes from the intensiveness of the training given the medical student today, but such training is necessary in the very accomplishments of the things sought. A physician must be well trained to render him capable of doing the bulk of medicine surgery and obstetrics that falls to his lot where ever located, and his diagnostic skill must be highly sensitized to enable him to meet the emergencies of the day. The x-ray and laboratory are of vital importance in this accomplishment but a certain technical knowledge, and familiarity with these accessories are necessary for him to evaluate their good and use them to the best advantage. The progressive doctor today must have hospital facilities and modern laboratory equipment, and that community which fails to supply such necessities, in the course of time will be without a physician as conclusively proven by the modern trend. We must not lower our standards, for all the people are entitled to the most intelligent service and should not be satisfied with less. Rather, the communities should be educated to those things necessary to secure adequate medical service and the public spirited citizens, the state and the nation must each do its part in meeting these requirements. Too often, the well-intentioned theorist, earnestly strives to solve these problems and from his city experience undertakes to direct the course and suggest the essentials in rural medical service. His idea as to conducting the small hospital is gained from his daily contact with the city institution and its problems, and little does he realize that every dollar spent must be judiciously used and every unnecessary expense eliminated else the success of the venture is doomed.

The very waste in money and material in many of the large hospitals amounts to more each year than that available for the small institutions' every expense. The problems are different and their solutions must be determined by those most vitally interested and best able to judge the section's needs.

The city physician's experience is most valuable in helping to solve the rural requirements but his judgment may be biased by the problems which daily confronts him and the same measures may not be applicable to

the proper solution of urban and rural demands.

The most modern developments of a century ago would prove totally inadequate today, but the same grade of culture and refinement is not found in every community nor can the same financial outlay be afforded by each. In consequence wisdom dictates that leniency must be shown certain institutions and the same high standard should not be required of them as is to be expected in more favored communities, where the public is educated to their great value. None will question the wisdom of holding before those in authority and interested, the highest ideals, but the nearness of the approach to that goal will depend on community conditions. As time passes and advances are made, through experience and systematic education, further legal requirements must be determined by the status of each community.

Kentucky is essentially an agricultural State: her cities are few and many sections are sparsely settled and our future demands that the least favored portion be given the same opportunity for growth, development and protection of its citizenship as is furnished to the most favored, and all legislation must have a proper regard for every class and section. Do not place burdens on those communities most urgently needing assistance, so exacting as to tax beyond its ability; rather assist each community in having those things essential and meeting necessary problems, and as time passes and conditions improve higher ideals can and will be met.

#### CONCLUSIONS

(1) Adequate medical service in every community includes doctors, hospitals, technical equipment and an abundance of nurses, especially trained to fill the requirements of each community.

(2) The health unit, if properly organized and conducted under the leadership of a capable, tactful and conscientious health officer, prevents disease, lowers mortality and extends life. Every assistance should be given its legitimate functioning and its powers and limitations should be recognized and rigidly enforced.

(3) Good roads through every section of the county at all times are essential. A hard surfaced road by every farm should be the goal. This enables those slightly sick to visit the doctor; those seriously ill to secure him and permits comfortable ambulance service for those to be hospitalized.

(4) A portion of the gasoline tax should be expended in each county on the cross roads for every taxpayer is entitled to his or her pro rata of such tax.

(5) Each county should make adequate

annual appropriation for the hospitalization of its indigent sick, nor should political expediency determine its beneficiaries.

(6) The development of a community conscience which recognizes Christian, educational and adequate medical service as just for every individual in every part of Kentucky.

#### CALCIFICATION IN PULMONARY TUBERCULOSIS\*

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A voluminous literature has evolved in regard to calcium and its relation to tuberculosis. Tweddell, investigated this question in observation that workers in lime and plaster of Paris are practically immune to tuberculosis. Tweddell, investigated this question in America among manufacturers of lime and lime products. The manufacturers in their replies stated that no cases of pulmonary tuberculosis were ever noticed among their employees, and that they were unusually free from coughs and cold. In my own experience I have rarely, if ever, treated a plasterer for tuberculosis, and we have no record of ever having treated or diagnosed an employee of the Kosmosdale Cement Plant for pulmonary tuberculosis, although we have received several wives of workers from this vicinity.

These observations of immunity among workers in lime led to the conclusion that there was a demineralization in tuberculosis particularly in the calcium content of the body. Many inadequate experiments were conducted and calcium determinations made to support this hypothesis. These in a measure confirmed the idea, and led to a wide clinical use of calcium in the treatment of this disease. Reinvestigation, however, and more accurate observations fail to support the theory. We know that the calcium content of the blood and tissues is more or less constant and normally ranges between 9 and 11 milligrams per c. c. of serum. In tuberculous individuals the range is between 8.4 to 11 milligrams (Halverson et. al.)<sup>2</sup>

Maver and Wells<sup>3</sup> investigated the absorption of calcium from the intestinal tract in experimental tuberculosis. They determined the calcium content of the various tissues of the tuberculous animals fed calcium and the tuberculous and non-tuberculous controls on a normal diet and concluded that there was no essential difference in the average calcium content of the three groups. Their experiments did show considerably higher calcium values in those organs and tissues that ordinarily bear the brunt of tuberculous infection

\*Read before the Jefferson County Medical Society.



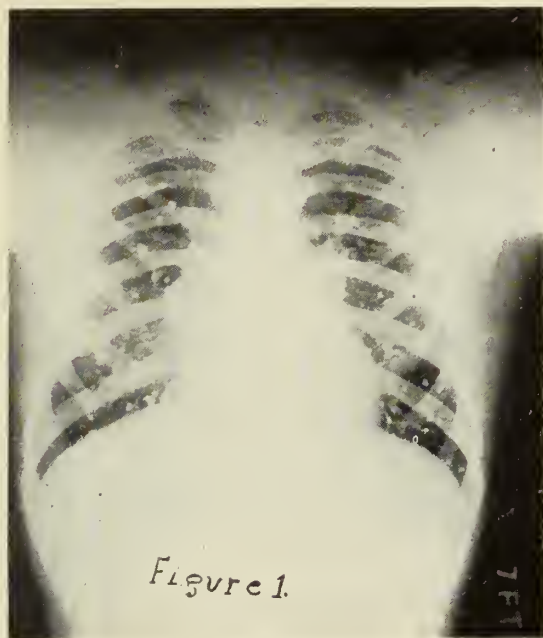


Figure 1, No. 54,014—U. H: Male, colored, age 14. The x-ray shows large, conglomerate, calcified lymphnodes in both roots with diffuse, irregular calcification scattered through the lung fields indicative of a previous, childhood, diffuse tuberculosis and probably a tuberculous bronchopneumonia. The mantoux tuberculin test was negative on one-tenth and one-milligram of tuberculin. This patient is apparently well; examination of the chest is entirely negative.

such as spleen and lymphnodes, but the amount of calcium in the tuberculous spleens and lymphnodes was often greater in animals that did not get calcium. This indicates a tendency for calcium to deposit in tuberculous lesions even though they are active and progressive. In inhalation experiments on tuberculous guinea pigs by Gardner, with calcium carbonate dust, there was evidence of increased calcification in the dusted animals as compared with the controls which ordinarily show no calcification.

Greisheimer and Van Winkle<sup>5</sup> investigated the plasma calcium in tuberculous adults selecting a group of 55 patients between the ages of 25 and 51, in the moderately advanced and far advanced stages. All were on routine sanatorium treatment, and a few were receiving in addition calcium lactate, cod liver oil or lamp and sun exposure. As a result of their investigations, they conclude that there is no demineralization in tuberculosis, and that cod liver oil, and radiation either by sun or lamp does not increase the plasma calcium even when clinical improvement is evident. There was a tendency, however, for higher calcium values among those patients who drank liberal

quantities of milk regularly than those who refused it.

Greisheimer and Arnold<sup>6</sup> carried out similar investigations in children with negative results. Those children on ultra-violet radiation showed no greater increase in serum calcium than those without such exposure. From these and many other experiments and analyses, we must conclude that the calcium content of the blood and tissues in tuberculosis show very little departure from the normal and that calcium therapy is based on a wrong premise. Notwithstanding this, we are faced with the inescapable fact that workers in lime exhibit a practical immunity to tuberculosis. Morbid calcification appears to be brought about as a result of chronic inflammation and is more prone to occur in those tissues that normally excrete acid such as the lungs and kidneys. Calcification as it occurs in tuberculosis shows no essential difference to calcification in other conditions. According to Wells,<sup>7</sup> "Calcium salts are laid down in the tubercles in accordance with the universal principle that necrotic tissues or any other non-living permeable material whether dead tissue, avascular hyaline connective tissue, or extraneous foreign material, which cannot be absorbed will become impregnated with calcium salts."

In a consideration of metastatic calcification,<sup>8</sup> he offers the opinion that the carbon dioxide of the blood and tissues plays an important part in the absorption, transportation and deposition of calcium salts since in this condition lime salts are deposited in the alveolar walls of the lung (where the carbondioxide is given off from the blood;) the left side of the heart and the pulmonary veins and systemic arteries where the blood is poorest in carbondioxide.

In the routine interpretation of roentgenograms of the chest, we frequently observe a diffuse calcification scattered throughout the lung fields which must be taken as evidence of a previous diffuse caseous tuberculosis. Some of this calcification is irregular in outline and hence is in all probability the result of a scattered, tuberculous, bronchopneumonia that has resulted from a bronchogenic spread from ruptured, caseous, hilum lymphnodes. (Fig. 1) In others, the diffuse calcification is uniformly distributed, symmetrical in outline, and hence must represent a hematogenous or lymphogenous distribution. (Fig. 11) Calcification as observed in the roentgenogram of the chest must be taken to represent evidence of a past, childhood tuberculosis, because it is this type of lesion that favors a deposition of calcium salts.

Healing ordinarily takes place by absorp-

tion of the exudative, inflammatory reaction with complete clearing—leaving very little evidence of its ever having been present. Apparently when caseation supervenes, if resistance is good, this favors the deposition of calcium salts. In the adult type of tuberculosis, one rarely sees healing by calcification. This may be due to two reasons: first, the pathological process is characterized by infiltration and exudation that undergoes healing by absorption of the inflammatory process and repair by fibrosis. I cannot recall ever having seen tuberculosis in the adult undergo a reparative process by the deposition of calcium at the tuberculous foci, although we have followed some of these cases for ten years. It probably does occur very slowly and over long periods of time. This is exemplified by the film on T. J. C. (Fig. III). This patient was admitted to Waverly Hill Sanatorium in 1916 at the age of twenty-six. While at the institution he had 56 pulmonary hemorrhages. Re-x-ray of this patient's chest eleven years later shows evidence of diffuse calcification throughout both lungs which must be considered as healing by calcification in an adult. Re-x-ray four years later shows no discernible increase in the calcification over that observed four years previously. Numerous cases of healed miliary tuberculosis as manifested by diffuse, sym-

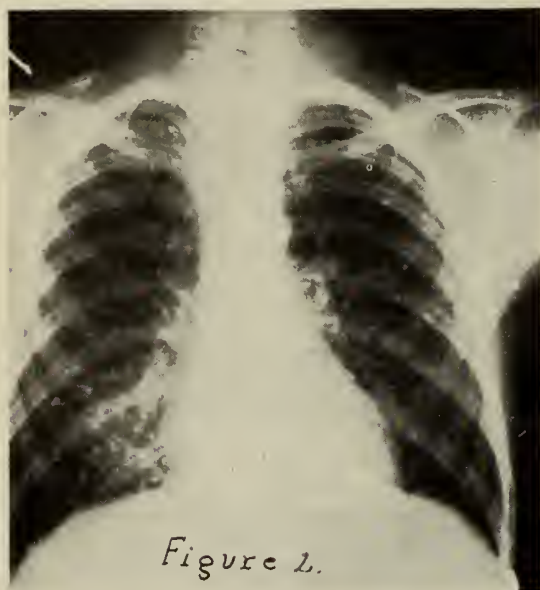


Figure 2.

Figure 2, No. 46,193—J. M: Male, white, age 11. The x-ray shows in contrast to figure one no massive calcification in the root, but uniform, symmetrical, shotlike, calcified densities scattered throughout the lung roots and lung fields which is suggestive of a hematogenous or lymphogenous distribution throughout the lung fields. The mantoux tuberculin test was strongly positive on one-tenth milligram of tuberculin.

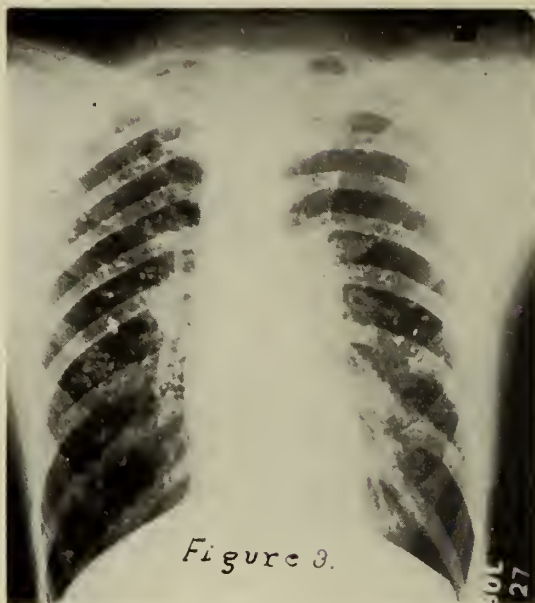


Figure 3.

Figure 3, No. 25,980—T. J.C: Male, white, age, 41. The x-ray shows irregular calcification scattered throughout both lung fields from base to apex. This represents a very unusual type of healing in tuberculosis, that is, healing by calcification which only occurs slowly and over long periods of time. The patient was treated for active tuberculosis in 1916; he had fifty-six hemorrhages while in the institution.

metrical, calcified areas throughout the lung occur more frequently than one would suppose. We have films on twelve such cases. The type of infection has no influence on the extent or degree of calcification as Wells found on analyses of bovine and human tuberculous lesions that the calcium content was strikingly parallel. Sayers, of the United States Public Health Service recently collected a remarkable series of cases numbering 125 in all that show diffuse calcification through the lung fields. These men had formerly worked in the wheat fields, and he was able to isolate an *Aspergillus Niger* and *A. Fumigatus Fisheri* from their nasal cavities. He expressed the opinion that such calcification may be due to organisms other than the tubercle bacillus.

Just why calcification occurs so promptly and uniformly in children and is seen developing so infrequently in adults is not clear unless we consider it on the basis of a pathological concept of the disease. We must consider that calcification takes place ordinarily in lesions that are already healed. We have observed large, fibrocaseous tubercles in adults that were well circumscribed, and have followed these for four and six years respectively, and have seen no tendency for calcium to become deposited in this area although it must be considered as an arrested



process. Calcium certainly plays an important part in the growing and developing child. It is a growth-promoting factor and since we see calcification developing so frequently in tuberculous lesions in childhood, it would indicate calcium should be available in excess in the average child's diet.

Sherman<sup>10</sup> in an investigation of calcium requirements in man has fixed the average minimum at 0.45 gm. per man per day in an analysis of over 224 typical American diets. The average intake of calcium exceeded this requirement but one in every six was below the indicated standard. While calcium may be administered in the form of calcium phosphate in ordinary table salt, the best and most available form is in milk and milk products. For the above reasons an abundant supply of milk should be a normal constituent of every child's diet.

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#### DISCUSSION

**T. Cook Smith:** I wish to discuss this very interesting paper from the standpoint of the rate of calcification and the relation of calcification to healing.

Among the questions which are unanswered at this time is the one relating to the cause of rapid calcification in certain people, whereas many others do not calcify at all while under observation. I have in mind a child who showed marked calcification, by x-ray, of the cervical glands, at the age of 10 months. At the same time, there was an active, progressive lesion in the pulmonary fields. This and other similar experiences bring out the fact that calcification, although indicating healing of that part which is becoming calcified, does not indicate that the patient is healing all of his lesions, but, on the contrary, the disease may be progressing in other places. Likewise, soft, uncalcified tuber-

culous lymph glands may be found close by calcareous ones.

It is becoming increasingly necessary that we pay more attention to x-rays of the abdominal field to discover calcifying glands in that region. Dunham and Smythe have shown very clearly that an appreciable percentage of patients with positive tuberculin tests have calcifying glands visible by x-ray in this region.

Let me again express my appreciation for the unusual series of x-rays which we have seen this evening.

**George A. Hendon:** I would like to ask a question in regard to the kind of calcium it is that is deposited in the lungs. Is it carbonates, sulphates or oxide?

Another point which might be of interest is the fact that we have two kinds of calcium which are used in the blood stream, diffusible and non diffusible.

The amount of calcium estimated in the blood stream is normally 10 mg to each 100 c.c. and I am just wondering if it is the non-diffusible that is deposited in the diseased area.

**Jos. M. Frehling:** Dr. Miller seems to hesitate to offer the suggestion that cases of tuberculosis show a deficiency of blood calcium, because the work of several investigators tends to show that the blood calcium remains fairly constant. My reason for mentioning this is that I believe it has been quite definitely proven that the blood calcium has a tendency to remain constant even though a definite deficiency of calcium in other parts of the body may exist; in other words, those salts which seem to be essential to life, including calcium, potassium, phosphorus, and magnesium, maintain a constant level of concentration in the blood at the expense of the tissue cells and that, although the individual cell may become markedly deficient in one or more of the constituents, a determination of the concentration in the blood may be normal. Only when the cells have been completely depleted of their salt content will the concentration in the blood begin to drop. Therefore, it can be concluded that a determination of the blood calcium cannot be considered as reliable proof that a deficiency does not exist.

**I. T. Fugate:** Dr. Miller's films and excellent demonstration is very interesting indeed. It is through this type of report and discussion that we get the intricate points of tuberculosis which cannot be demonstrated, except through x-ray study.

I was particularly impressed with the number of films which showed an immense amount of calcification while others showed such a small amount. This certainly is to be interpreted in ratio to the patient's resistance to this disease. Through my work of filming many of the ex-service men throughout the State and Southern Indiana over a period of years, one of the in-

asionally encounter a case which shows marked calcification often times extending into the third lung field with nothing whatever in the history which could be interpreted that the patient was ever sufferer from this disease. Probably the best explanation is the fact that these patients had suffered from pulmonary tuberculosis in childhood which was entirely overlooked.

One of the interesting things in the study of this disease is the fact that often times you will find a chest with a minimum amount of tuberculous changes without calcification, and these types of cases it appears, without many exceptions, are the hardest cases to bring to the point of recovery; while on the reverse you will find a case with extensive tuberculous involvement with a great deal of calcification which will carry on with reasonable care and treatment to what is apparently fair health and will live out their expectancy.

In other words it seems that the cure of tuberculosis resolves itself to a great degree as to whether or not the patient is able to build up a barrier or calcification.

**Oscar O. Miller**, (in closing): Dr. Smith brought out a very interesting point; that is the length of time required for calcification. This varies from five months to several years. Calcification is not to be taken as always indicating complete healing.

Dr. Frehling infers that I question a deficiency of calcium in the blood in tuberculosis. I do; and if experimental data means anything, it certainly shows that there is no deficiency of calcium in pulmonary tuberculosis. When one investigates the question of dental caries, no more caries is found in pulmonary tuberculosis than in non-tuberculous individuals. I am willing to admit that children may have a normal blood calcium level and yet be growing up calcium poor. The standard requirements for calcium for man is 0.45 grams; and this is ordinarily available in the average diet, in fact, Sherman found an excess of 67 per cent in calcium above the standard in the diets investigated by him. One pint of milk contains 0.5 grams calcium which is approximately the normal requirement.

**The Value of Tuberculin Tests.**—The Medical Research Council has issued a report by Dr. P. D'Arcy Hart on the value of tuberculin tests with special reference to the Mantoux intracutaneous test. He concludes that the test is chiefly of value when negative. All that a positive result indicates is either a past or a present infection with the tubercle bacillus. A clear distinction must be drawn between tuberculous infection and tuberculous disease. More than 90 per cent of the adult population has at some time been infected with the tubercle bacillus and overcome the infection without developing tuberculous disease.

## DIAGNOSIS OF DUODENAL ULCER\*

WILL T. DOWDALL, M. D.

Paducah.

The diagnosis of duodenal ulcer has been made accurately only within the past few years; that of gastric ulcer has been for years. There are approximately three times as many duodenal ulcers as gastric.

But the diagnosis of duodenal ulcer is not made by the history alone, which is directly opposite to Moynihan who in these words expresses himself: "It is therefore not necessary to the attaining of a diagnosis that any examination of the patient be made, the past history is everything, the physical examination is relatively nothing."

Each case has to be thoroughly observed, and it takes three day's hospital routine to lay before you the finding so as to render the study complete. There are three necessary procedures.

1. History.
2. Physical examination.
3. Roentgen ray interpretation.

One important part in the history is to listen and let the patient describe their own symptoms and give their complaints in their own words. Then question them along these lines.

1. Periodicity.
2. Pain.  
Location.  
Radiation.  
Character.  
Relation to food intake.
3. Tenderness and soreness.
4. Nausea and vomiting.
5. Constipation.
6. Belching.
7. Weight.
8. X-ray.

This all being gone through you are ready for the general physical examination, for without it you cannot make your diagnosis. Blood pressure is taken, for in arteriosclerosis we sometimes have abdominal pain. Then the temperature and pulse for signs of infection. Pupillary reflexes, the size and equality of the pupil. The thorax, the abdomen and the pelvis; teeth, nose and throat, also the weight, and this is repeated every seven days. The rigidity of muscles, tremors, the reflexes, blood count, sputum, urine, and stools. In case there are any chest findings the same are x-rayed for more minute study.

The blood Wassermann is reported and if there is any doubt, the spinal fluid is taken for further study. The stool examination is made for occult blood, parasites and blood.

\*Read before the McCracken County Medical Society, December 16th, 1931.



Generally this is an important examination in showing a differential point between duodenal ulcer with blood in the stools, and in gastric there is more frequently hematemesis.

At times, in acute cases there is intestinal hemorrhage in an apparently well person with an acute pallor, and an evacuation of black arterial blood and bright red arterial blood. Then we have the Ewald meal followed by the gastric analysis showing the free HCL, the total acidity blood and occult blood.

Men are affected by duodenal ulcers more than women. Most people are susceptible between the ages of 20 and 45 years. Duodenal ulcers cause less distress than gastric ulcers, and also less delay of the stomach contents. The periodicity occurring at regular intervals, generally coming on for years; one case has had it for the last twenty years.

Another characteristic is the hunger pain usually appearing in from two to four hours after the food intake, also the sense of fullness, distention, gnawing and burning. The whole of the abdomen may pain, but generally it is to be found in the right upper part about one inch below the tip of the ninth rib. Food or liquid relieves the pain, pain comes earlier with liquids than solids.

Tenderness and soreness are in the midline, at times to the right.

Vomiting is a symptom, but in duodenal ulcers there is often relief from one vomitus; in gastric frequently there is food in the vomitus, and in gall bladder infection a cyclic vomiting.

The referred pain is nearly always epigastric not going to the scapula as in gall bladder infection. Another point is that pain comes on at night, the patient is awakened between one, two a. m. They frequently have their food near the bed within reach and are relieved by food intake. Also in the spring and fall of the year are the most likely times for attacks, and these last from two weeks to several months.

Mental anxiety and physical exhaustion are also predisposing causes as a rule. When a diverticulum is found it indicates a perforating duodenal ulcer.

Patient may complain of sickness, heart burn, hyperacidity, nausea, and pain before vomiting, of black stools and hematemesis—this combined with a physical examination showing soreness in the epigastrium or just to the right of the midline, rigidity of the rectus, a report of increased acidity and hypermotility and hypertonus and hyperperistalsis, accompanied with a fluoroscopic examination revealing a deformed duodenal cap or bulbous duodeni are very good indications of a duodenal ulcer. The x-ray is a valuable ad-

junct for when the 'cap' is deformed the diagnosis is almost certain, although the defect in outline may be difficult of demonstration, but when a normal cap is seen, a negative diagnosis is the rule.

Another is the speedy appearance of the barium contents from the stomach to the duodenal, showing hypermotility, hypertonus and hyperperistalsis. Also spasmodic hour-glass contraction of the stomach produced by duodenal irritability or irritation. So with rapid clearance, or hypermotility may occur in duodenal without obstruction, and then the reserve happens, delay occurs when spasms or adhesions or large indurated ulcers stop the clearance.

The fluoroscope often reveals an enlarged aorta, which suggests syphilis, and is often confused with a simple chronic duodenal ulcer. The tender spot should be palpated, while the patient is in front of the screen so as to coincide the x-ray defect with the pain point.

This is a good illustration of an error in diagnosis: H. L., age 59, was admitted to the hospital March 24th, complaining of pain in the stomach which he had had for the last fifteen years. Pain made worse two or three hours after eating, it is a gnawing and burning pain and there is distress and distention with heartburn and belching. Also nausea and vomiting, the latter, however, in cycles, pain is relieved by food intake.

Urinalysis shows large traces of albumin, with a few hyaline casts, sputum negative, blood Wassermann negative.

Ewald meal followed by gastric analysis shows free HCL, .08%.

Total acidity, .17%.

Bile present.

Occult blood present.

Shows a low HCL and T. A. lactic acid negative Oppler-Boas bacillus negative. Guaiac tests for blood show a large trace. Stools: Occult blood negative, following a meat-free diet. Bile and pulse negative. Red blood count 4,500,000, leucocytosis 6000; Hb. 80%; blood pressure 130/80=50 P. P.

Percussion and auscultation of chest negative. Rectal examination shows an enlarged prostate nodular, bilateral and moderately firm.

Fluoroscopy and roentengrams of the stomach reveal a persistent filling-defect immediately prepyloric and on lesser curvature opposite defect. Appetite good, constipation and loss in weight.

He was first put on the stomach diet with negative result, then it was thought on account of the filling-defect that a tentative diagnosis of cancer was made, however, not satisfied with this and it was also becoming

more clear that the patient's memory was faulty, forgot the day, the dates and events of the day; and soon he had no idea of the time, place or the people and especially at night, he was talking to imaginary people, his wife arrived and he did not recognize her. The Babinski was negative, the spinal fluid was taken and it revealed 100% Wassermann plus positive and the diagnosis was clear. This case shows in spite of almost all tests and positive signs, we still have to look for syphilis.

It is surprising how frequently lues is the cause of the so-called duodenal ulcer.

Diagnostic acumen will not improve as long as we say it may be cancer, a gall bladder, an appendix, a syphilis or a duodenal ulcer. The diagnosis will be accurately reached after you study the case, and in the case just given shows how an exhaustive study is necessary before you reach the right diagnosis. For without the spinal fluid we should not have completed our study and obtained a correct diagnosis.

#### PROPHYLAXIS AND TREATMENT OF CHRONIC NEPHRITIS\*

LATTA GRAVES, M. D.

Scottsville.

If we accept the truism that chronic nephritis is a progressive and incurable disease, we must admit that our present methods of a treatment of this disease is deficient.

Our present therapy is largely symptomatic and is based on our knowledge of renal function rather than on anything deeper.

Preventive treatment is almost non-existent and will remain so until more is known of the etiology of chronic nephritis and particularly of the factor that influences the progressive development of renal lesions.

Almost all of the medical research in the past has been restricted chiefly to laboratories and in a less degree to hospital wards where disease has been studied after it has reached an advanced stage, or after it has killed the patient. In my opinion the future progress in the prevention of this disease does not depend on research work under these conditions so much as it does on observations made in the earliest stages of the disease when its course may be amenable to treatment.

Mallory believes that chronic nephritis is due originally to a toxic lesion which may be of several varieties, but most commonly bacterial. This lesion may terminate in recovery, if the patient survives, or more gradual sclerosis in the capsular space, glomeruli

or blood vessels as the result of the process of repair. Sclerosis of the kidney, as it appears at necropsy is the sum total of sclerosis affecting parts or the whole of many units of the kidney and is due to repeated acute or chronic insults.

Davis cultured the tonsils from ten cases of nephritis and in nine found hemolytic streptococci, the predominating organism. Other research workers have injected rabbits with streptococci from cases of acute tonsillitis and found renal lesions in more than fifty per cent of their cases.

They believe these organisms, besides causing acute nephritis also produce characteristic chronic nephritis.

Klotz injected various strains of streptococci viridans into rabbits and was able to produce a form of interstitial nephritis, which subsequently developed into a well marked renal sclerosis.

As a result of these experiments attempts have been made to treat nephritis by the removal of all possible foci of infection.

Billings and Watkins report a number of cases greatly improved after tonsillectomy. Foci of infection should be carefully and painstakingly searched for and removed, if practicable. Apical abscesses of the teeth, diligent examination of accessory sinuses, prostate, gall bladder, appendix, cervix uteri, or any chronic suppuration in the body may be the source from which the kidney becomes infected.

There is only one time to cure chronic nephritis, namely, before it starts. Therefore the prophylaxis must be directed at the removal of all sources of infection and the diligent and efficient treatment of acute nephritis after it has developed.

The number of people with acute nephritis who are condemned to die of chronic nephritis is unnecessarily too high, due to failure of the physician to recognize the absolute necessity of adequate treatment of the earlier and less marked manifestations of the disease.

Recent investigations have destroyed our faith in many of the older methods of treatment, without adding many new aids, on the whole the patient is much more comfortable under the new regime and the life expectancy will be greater when the patient is treated along the line of pathological physiology of the underlying disease.

All patients suffering from acute respiratory disease, acute infectious diseases, severe burns, purpuras, etc., must be observed closely and examined carefully so as to find and control incipient kidney involvement.

A woman known to have chronic nephritis should be instructed in contraceptive methods to prevent pregnancy. Stiegleitz has shown that very few of these women go to term the

\*Read before the Third District Medical Society at Bowling Green.



average time of delivery being seven months. There is a sixty per cent fetal mortality and eighty per cent of all these patients were classified in poor or bad condition six months after delivery.

There are many classifications of nephritis. Every one has his own classification, each more complicated than the last, as the kidney is made up of many different structures, any anatomical classification is apt to be complex and as the pathological picture contains so many different aspects which are always changing, it is apt to be more confusing than the anatomical classification, besides it takes an autopsy to determine exactly the type of lesion present, obviously it is then too late to treat the patient satisfactorily. Rather let us look to the functions of the kidney for a satisfactory classification, which will enable us to treat the nephritis efficiently.

The functions of the kidney are by its secretion or excretion to maintain an equal concentration of water and inorganic material in the body and to dispose of waste or useless material.

The kidney secretes two classes of substances. No. 1. Those which can be of use to the body as water, glucose, salt, bile, hemoglobin (2) Purely waste products as urea and allied nitrogenous substances. To prevent the excretion of the first group, the kidney establishes a threshold sufficiently high to prevent the secretion of any but excess amounts of these substances. Since all of the second group are waste products, no barrier is necessary.

I like Browns of Saint Bartholomew Hospital, Secretary Classification of Chronic Nephritis which is as follows:

(1) Hydremic Nephritis. Roughly corresponding to chronic parenchymatous nephritis. In this type the threshold for the excretion of useful substances salt and water is raised, therefore an excessive amount of these substances are retained in the body.

(2) Azotemic Nephritis. Gross failure of the concentration power of the kidney. Since the great work of the kidney is concentration in relation to the nitrogenous waste products, as urea is the most abundant of these, we find a fall of urea in the urine with a consequent retention in the blood. Cardio vascular changes are marked in this type.

(3) Mixed Type. Since the azotemic changes proceed more slowly than the hydraemic, the former gradually alters the picture so that the hydraemic gradually merges into the azotemic, if not dying from some inter-current infection. We find the edema gradually subsides. The blood pressure goes up, the heart hypertrophies, both sodium chloride and urea are retained. If there is

both urea retention and edema, the case is a mixed one.

Hydraemic Nephritis. The chief symptom of this condition is the presence of an excessive accumulation of fluid in the body. Epstein's explanation of this renal edema is (1) there is a serous drainage of the blood proteins into the urine as much as ten per cent of these may be lost daily. In this way there is a fall in the osmotic pressure of the blood with a consequent retention of water by the tissues. (2) Lipoids, especially cholesterol tend to accumulate in the blood and tissues, this tends to increase the tissue edema. In these cases the cholesterol will be much above normal when edema is present and when the edema subsides the blood cholesterol will become more nearly normal. Epstein advises a high protein diet, with very little fats. This will greatly reduce the edema by replacing some of the lost blood protein and by providing large quantities of urea acts as a natural diuretic. This high protein diet is only applicable when there is no urea retention. Here McLeans urea concentration test of the urine is of value in determining a beginning urea retention. Even before the blood urea shows much change. It shows whether given a definite amount of urea to deal with the kidney is able to do a definite amount of work. If the blood urea is normal and McLean's test figures are too low, it probably means that urea retention is just beginning and Epstein's diet is not indicated. In case of no urea retention a diet which includes large amounts of such substances as meats, chicken, bacon, eggs, fish and cheese will often give dramatic results, however, if the patients dyspeptic symptoms interfere, he may not be able to tolerate this diet and it may be necessary to start with moderate amounts of protein and gradually increase it. In favorable cases the edema begins to disappear and marked improvement usually sets in. In six weeks to two months. This improvement is generally accompanied with a slight increase in blood pressure and a slight rise in the blood urea. When the edema disappears the protein contents of the diet should be reduced to sixty or eighty gms per day and the carbohydrates and fat increased in proportion. Salt free diet when the blood chlorides show an increase.

The worse treatment for hydremic nephritis is a poor sloppy diet. Soups are harmful because of the large amount of fluid and large amount of mineral salts in them, causing an extra amount of work to be thrown on the kidneys, which is all out of proportion to their food value. A badly nourished patient generally goes down rapidly. Anemia and edema become extreme and death soon closes the scene.

There are three kinds of diuretics used in renal edema, which act (1) by vaso dilation of the kidney vessels; caffeine acts this way and may act as a direct stimulant to the renal epithelium. (2) Increased cardiac efficiency. Digitalis is an example. (3) By increasing the quantity of circulating fluid. (a) increasing absorption of water from the intestines by giving large quantities orally. (b) Increasing osmotic pressure in the blood. Saline diuretics and urea act this way by attracting water from the tissues to the blood.

Which group of diuretic is indicated in hydremic nephritis? The vaso dilators and stimulating diuretics are harmful because they break the physiological law of rest to all damaged structures. Diuretics that increase the cardiac efficiency are only of value in edema associated with a broken compensation of the heart.

Increasing the circulating fluids in the blood especially if the fluid is withdrawn from the tissues can do no harm and may do good. Urea is an example of this type. Its use is indicated in hydramic nephritis, but not in the azotemic or mixed type. We give it in 15 gm doses, dissolved in two ounces of water twice a day for about a week after you rest of a day or so, the dose is repeated for another week. It is non-toxic and its use is attended with no bad symptoms. In favorable cases there is a gradual disappearance of the dropsy.

It is important to carry out various kidney function tests from time to time for no reasonable therapy can be carried out without a definite knowledge of the variations in functional capacity of the kidney.

Bennett has advanced the idea that the study of etiology of renal edema will leave us with the impression that pathological changes in the tissues occur other than those in the kidney. This is the idea of the use of novasurol and euphyllin, since they act directly on the tissues, enabling them to give up their water. I have had no experience with euphyllin, but in some cases novasurol has produced good results. In giving novasurol it is necessary to first raise the hydrogen ion concentration of the blood, this is accomplished by giving one or two drams of ammonium chloride on each of two days. Upon the third day one-half to one c. c. of novasurol is injected intramuscularly. This is repeated in two or three days. Recently O. Donnell and Levin have published an article in the Journal of the American Medical Association in which they advocate the use of calcium gluconate in this condition of renal dropsy. Their reports seem quite encouraging.

I usually advise these patients to drink just enough water to make them comfortable.

I very seldom use the skin as an alternative method of excretion. There are four objections to its use which greatly override any advantages that it possesses. (1) Only three grams of nitrogen can be eliminated through the skin while eight grams can be eliminated through the bowels (2) Diaphoresis is an exhausting process and in cases of cardiac deficiency has been followed by collapse and death. McLean reports three cases of such accidents. (3) When sweating is profuse the urine becomes very concentrated and this throws an additional strain on the kidneys. (4) Withdrawal of so much fluid without a correspondingly removal of organic solutes tends to concentrate the toxins present in the kidneys and tissues.

The argument may be advanced that after a hot air bath the patient is often covered with small crystals, these are chiefly sodium chloride and not urea.

When there is a large increase in blood chloride hot air baths may be beneficial. If the chlorides are the chief cause of edema, elimination of the salt breaks the vicious circle and oftentimes in these cases a diuresis follows the diaphoresis.

Sometimes the accumulation of fluid in the abdomen and chest becomes so great that mechanical removal is necessary.

The bowels should be kept loose with some saline purgative.

In very obstinate cases decapsulation of the kidney may be tried if the following conditions are fulfilled. (1) Persistence of edema for three months in spite of careful medical treatment. (2) Absence of urea retention. (3) Absence of cardio vascular changes but too much must not be expected of the operation.

Azotemic Nephritis or Chronic Interstitial Nephritis. In this variety the kidney gradually loses its ability to excrete nitrogenous waste and there is a tendency for nitrogen retention in the body. There is no drug treatment of any use in this type. With reasonable care more or less good health may be maintained for a number of years. The treatment is largely one of general regime.

Careful dieting is most important, but every patient has different requirements. The principle of the treatment must be to reduce the work of the kidney to the lowest possible level consistent with maintenance of good nutrition. It is important to run blood non-protein nitrogen, blood urea and McLean's urea concentration test. These are the only methods by which intelligent dieting can be carried out. If they show the excretory power of the kidneys is good the diet may be richer in protein. If it is poor, a low protein diet should be given unless it is possible to give at least 40 gm protein per



day, the patient's general health will suffer. In advanced conditions it may be necessary to give less protein but usually I give Von Noordens diet for a week, then give a diet containing about 20 or 30 gm. of protein and enough carbohydrates and fats to give sufficient calories. Gradually increasing the protein content as the patient can take care of same.

The prevailing habit of cutting down the protein ration of patients suffering from mild chronic changes does not benefit the patient but rather makes him weak, anemic, and an easy victim of any intercurrent infection. The idea that red meats are more harmful than white meats has been exploded long ago. In fact, any patient with a marked renal deficiency must be careful not to waste what little ability he has to handle protein. He, above all, must eat only such protein as are most effective in replacing his body protein, therefore meats, eggs, fish, fowl and milk products are the ideal protein for him because they meet his requirements to the greatest degree. I do not recommend these in unlimited amounts but only in a quantity sufficient to replace tissue waste in the body. Withholding salt is not indicated as a rule in azotemic nephritis.

There should be no attempt to check the polyuria found in this condition. Polyuria is a compensatory mechanism which the kidney has adapted to make up its inability to vary the output to the intake. It is not an evidence of good ability to excrete water but rather it is just the opposite. A certain amount of water must be put out daily to remove the waste product. The water excreting mechanism is reduced in efficiency and must work day and night to put out sufficient urine. When the kidney loses its power to vary the output to the intake the terminal stage is reached. It may be possible for awhile to carry on by means of the polyuria and increased blood pressure but it is in a precarious condition. Water should be allowed freely and alcohol forbidden. No attempt should be made to lower the blood pressure.

Uremia. There are various classifications by the many different writers, but as a basis of my discussion I am making my classification in two groups.

(1) Renal Uremia. (2) Urinary poisons. In the former we have increased blood pressure, eclamptic attacks, mental disturbances, paralysis, disturbances sensation and amaurosis.

In the latter, stupor, coma, some mental disturbance, periodicity of pulse and conditions in general of chronic uremia.

We may have eclamptic uremia occurring independent of impaired kidney func-

tion when it is associated with glomerulonephritis or in the second stage glomerulonephritis or with benign hypertension.

Treatment: In the plethoric individuals of this type 500 c.c. of blood or more should be removed, followed by lumbar puncture governing the amount of cerebrospinal fluid by the pressure. Twenty to forty c. c. may be removed.

Chloral Hydrate is sometimes given by rectum. The P. S. P. test should be done and unless the output is below 40% in two hours it is not likely that the urea will be increased. Mercurials are given in most instances, absolute quietness and a darkened room is the best for the patient.

True uremia is the form associated with the end state of nephritis, produced by the retention of waste products of nitrogenous metabolism represented chiefly by non-protein nitrogen, urea and creatinin in the blood.

Lower the protein intake, spare the body protein by high carbohydrate diet, increase the fluid intake and give glucose 10% solution by proctoclysis.

Venesection should be done only after a careful consideration of the condition present. Anemia and weakness are usually present and in this case venesection would do more harm than good. Increase elimination through the bowels and skin.

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**Behavior of Monocytes in Tuberculosis in Children.**—Reilly studied thirty-two tuberculous and five non-tuberculous girls by Sabin's supravital bloodstaining technic for monocytes from May until October with repeated examinations. The patients had mainly hilar node lesions. Percentages and actual numbers of lymphocytes and monocytes were computed. A comparison was afforded by simultaneous Wright's staining, which is inferior in picking out monocytes. In clinically active tuberculosis the results of supravital staining, as judged by the ratio of monocytes and actual numbers of monocytes, corroborated this clinical impression of activity in 62.5 per cent of the patients. The ratio of monocytes to lymphocytes corroborated the impression of clinical inactivity in 92.3 per cent of the patients, while the actual number of cells corroborated this impression in only 76.9 per cent. The method is somewhat tedious and time consuming, and not practical except for a large number of patients. Results confirm the observation that in active tuberculosis the monocytes increase in number and the lymphocytes decrease, while the reverse holds true when inactivity set in.

# SHALL WE CONTINUE TO PERPET- UATE FEEBLEMINDEDNESS?\*

H. C. CLARK, M. D.

Falmouth.

When we undertook to write a paper on the feeble-minded of all types, we believed we could write to the Feeble-minded Homes in each state and find out how many feeble-minded of all grades there were in these homes, and in the counties of each state; also the number of these mentally deficient types that had been sterilized. We very soon learned that there were at least seven to ten times as many of these unfortunate beings outside of institutions in each state as there were in the institutions.

We have been surprised to learn from each commissioner of the feeble-minded that very few had been sterilized on account of this mental deficiency in each state where a law exists permitting such an operation. Attempts to sterilize these feeble-minded individuals were met by objections from relatives, and, in some instances, the physicians were enjoined by a process in court.

Some of these injunctions have been sustained and the law declared unconstitutional. However, we believe this was where the subjects were criminals. In Indiana, they demanded a trial by jury, which was refused them, and approximately 600 were sterilized. An injunction was then filed and sustained; it was carried to the Court of Appeals and confirmed on two grounds:—First, the punishment was cruel, second, that it denied the individual the right of trial by jury. And so in that state, there is nothing being done.

There was a bill up in the Legislature at its last session perfecting the law, which as yet has not been put on the statute book. The truth is that there is doubt in the minds of many folks about whether or not every criminal who is mentally abnormal should be sterilized. The law does not include the feeble-minded and we believe if it had been applied to these individuals, it would be in operation today.

The Indiana Marriage Law prohibits cousins and idiots from getting married. (We mention Indiana because of that state's proximity to us) and the mistake they made was by not sterilizing 600 feeble-minded instead of criminals only. The rest of the states have replied to my letters, and the results show that, with few exceptions, they have neglected to have their feeble-minded treated.

The State of Washington has treated twenty idiots. No change in mentality.

New Hampshire has had thirteen treated

and there has been no change mentally or morally.

Maine has treated two since the law went into effect January 1, 1926. It is too soon, of course, to hear a report on change as to mentality.

Wisconsin has a law forbidding cousins and idiots to marry. They also have a law that permits the sterilization of criminals and idiots. One hundred and sixty have been treated, 40 of whom were idiots and morons. This has been within the last three years and no change mentally or morally has been noted.

Minnesota has marriage laws that forbid cousins or feeble-minded from marrying. They also have a sterilization law. In this state, seven idiots and morons have been treated. Their law became effective in 1925. The policy of the Board of Control is to sterilize only those who are able to support or partly support themselves at their homes, and allow them their freedom after sterilization.

We have not contended for sterilization of low grade idiots or imbeciles in the public state home for these folks, but advise it for those only whose behavior history would indicate that they could then be released into the community without becoming delinquents.

California has a Marriage Law forbidding idiots, imbeciles or cousins to marry, and a law permitting the sterilization of these feeble-minded groups. Wisconsin reaches not the low grade idiots or morons within the state home, but those who are permitted to have freedom in their own homes and partly or entirely make their own living and associate with other folks after the treatment. There is no danger then of their begetting offspring. California has sterilized 982, but only 2 of this number were of the criminal type and were benefitted mentally.

The feeble-minded individuals who are not in state institutions, but are living in their own homes, scattered all over this land of ours receiving support from the state,—these individuals should be sterilized before they become either entirely or in part a charge upon the state.

The responsibility for the creation of such a breed of feeble-minded folks goes back to our marriage laws. In our own state of Kentucky, the laws should be so amended that parties applying for a marriage license should be compelled to publish their intentions thirty days before receiving their marriage license. In addition, the County Clerk should be required to give bond for the faithful performance of his duty in the matter. In my own county within the last two weeks, the mother of an eleven-year-old girl secured a marriage license for this child who was not

\*Read before the Annual Conference of City and County Health Officers.



present herself. We knew two brothers in this county who married their own first cousins in 1882. Seventeen children were born to these unions. There are but five of this number who are physically and mentally normal. All the others are mentally and physically deficient and four adults have the minds of two or three year old children. I could go further in tracing this family to where there has been three or four marriages between the children of these brothers, and these in turn begot other defectives. This is too horrible to think of, yet it must not be put aside any longer, but should be shown on the screen. It is no worse than many of the demoralizing pictures displayed every night in some of the picture shows.

We know a moron married to a woman of the same type, and they have five idiotic children brought in by sanction of our State law, or rather by the indifferent use of authority invested in our county clerks. It is a shame and public disgrace that, through careless exercise of duty to humanity, such marriages take place.

This problem is being brought to the front in every state in the Union, we have found from our correspondence with health boards. There are some feeble-minded children in families of good stock from unknown cause. But, we have been intimately acquainted with affairs in our county and among our patients, and we know that you get what you breed from. We hope to see the time when a certificate of health is required for the man and woman before a marriage license can be issued, and this certificate should be made by a physician other than the family doctor. Ten days should be allowed for the doctor to make a report of his findings to the Court, which report should be attached to the license before it could be issued to the contracting parties.

There are too many feeble-minded being born. In Kentucky, we have 460 in the state school, and more than two thousand waiting to be admitted as soon as there is room for them. Making an estimate from those we have found in our county (46) (with none in the state house), we must have 5,000 in the State outside of the Feeble-minded Institute, who are drawing in many ways from the county and the state. Most of this number should be sterilized before becoming a more serious public charge. If this were done, in a few years, the feeble-minded folks would be scarce.

There are plans in another state to build three more homes for mentally deficient of all types. They have the plans, specifications and money—only waiting for the locations to be settled. Do you not think it would be of far more lasting good to perfect

their marriage laws and sterilize most all of the morons and other feeble-minded and stop the breed. They could use their money in a better way, namely to prevent the production of this miserable class of humanity by forbidding the issuance of a marriage license to all of unsound mind and body, and those of close blood kin. This would reduce taxation and would soon have one of the greatest blots on humanity removed.

This crime of indifference brings sorrow and suffering to parents, and to the mother especially who has been weighted down and hampered by having to care for helpless feeble-minded children because she was first cousin to her husband or because he was mentally deficient.

The physician who loves and honors his profession has always had to bear the brunt of the fight, I know, but he must shoulder this responsibility of seeing to it that when another legislature meets, a bill will be introduced and passed that will remove this curse from our beloved state. A united profession has given us the best code of health laws on earth. We must so impress the importance of the feeble-minded problem upon the minds of our people that they can see the enormity of the crime we have been guilty of by allowing it to fasten itself upon us so that today it is more dangerous to us than almost any problem we have to solve. We possess the key that will solve the problem in prevention. We are interested in the care of those we have, but want to curtail their propagation by sterilization.

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**Angioma Venosum Racemosum of Pia of Spinal Cord**—Lassen's patient, aged 71, had had for five years mild but increasing symptoms of a nervous disorder, diagnosed as *tabes dorsalis*. Symptoms of compression of the spinal cord then appeared, with signs of ascending paralysis, and death soon occurred. Necropsy showed an extreme dilatation and inter-twining of the sub-arachnoid vessels, mainly on the posterior side of the spinal cord, from *intumescentia lumbalis* into the thoracic region and, less intensively, to the lowest cervical vertebra. Histologically the changes seemed to consist of a hypertrophic thickening of the walls of the vessels resembling the primary stages in the formation of varices elsewhere. Corresponding to the extent of the extramedullary changes there were in the spinal cord extraordinarily marked degenerative processes in the nerve tracts in the white matter together with pathologic increase of the blood vessels in both the gray and the white matter. While *tabes dorsalis* could not be excluded, the main diagnosis was *angioma venosum racemosum* of the pia of the spinal cord. No syphilitic stigmas were found in the organs.

## MANAGEMENT OF CARCINOMA OF THE BREAST\*

CHARLES D. ENFIELD, M. D.

Louisville.

There has been very little change in the surgical approach to cancer of the breast in the past thirty-five years. The radical operation devised by Halsted and Willy Meyer is employed almost unchanged by nearly all surgeons. Attempts to devise a more radical procedure, as that of the Swedish surgeon who amputates the arm, the clavicle and the scapula, as well as the pectoral muscles, have not shown sufficiently improved results to gain acceptance either by surgeons or patients. The present radical surgical procedure suffices to cure every case in which the disease is in fact, and not merely apparently, confined to the breast. The percentage of cases coming to operation at this stage is very small, estimated at from eight to twelve per cent, and will remain small no matter how much cancer education may improve the statistics in regard to cancer elsewhere in the body; since breast cancer metastasizes very early though the metastases may not become evident clinically for many months after the implantation has occurred. In this connection it should be emphasized that repeated or unduly vigorous examinations of suspicious breast lesions should be carefully avoided; likewise anything in the nature of a massage or unnecessary manipulation, as these procedures undoubtedly tend to detach cancer cells which may give rise to distant implants. Over forty per cent of axillae which contain no palpable glands do show microscopic cancer implants when the material removed at operation is examined carefully (Lee). Better and more widespread cancer education will no doubt result in a greater number of patients presenting themselves in the operable stage, but it will not remove or lessen the necessity of other measures to serve as adjuvants to surgical extirpation even in the apparently early case.

A quotation from the department of Queries and Minor Notes in the Journal of the American Medical Association, February 27th, 1932, may be taken as representing the consensus of opinion as to the preferable method of handling operable breast cancer today. "Preoperative irradiation, originally advised on the basis that a preliminary lymphatic block is produced, is no longer advised. Postoperative irradiation beginning about ten days after operation, is necessary and is undoubtedly responsible for the relatively

high percentage of present day cures."

Preoperative irradiation has fallen into disrepute perhaps more for reasons of policy than because it is entirely lacking in value. For instance one report from Memorial Hospital on a series of breast cases operated some years ago which had received X-ray treatment only before surgical interference showed five per cent more five year survivals than similar series treated by surgery alone. The objections are that such treatment interposes a delay of ten days to six weeks and that, if decrease occurs in the size of the growth during treatment, the patient may elect to forego surgery, a decision certain to be regretted both by the patient and the surgeon. Pfahler, who has advocated preoperative X-radiation more strongly than any one in this country, reports in a large series of cases improvement in five year survivals of fifty per cent where intensive radiation was used both before and after operation. In rapidly growing medullary carcinoma it has seemed to us on several occasions that an intensive course of radiation before, as well as after operation, has resulted in a survival considerably beyond the expectations of either the surgeon or the radiologist. Likewise, the late case with open ulceration, which has progressed far beyond the stage of being operable in the sense that there is any hope of cure, can frequently be improved sufficiently to permit a mastectomy and thus relieve the patient and her family of the distress incident to a foul discharging ulcer. In both these types heavy dosage can be administered since the skin areas to be sacrificed can be as a portal of entry for very large amounts of X-ray.

It is calculated that from ten to fifteen erythema doses of radiation are necessary to destroy the usual type of scirrhous cancer of the breast and this fact has been made an argument for the futility of all postoperative or preoperative radiation from external sources, since at most some five or six erythema doses can be delivered to a breast tumor without permanent skin damage. The argument is fallacious for two reasons. A cancer cell can be rendered innocuous as far as producing metastasis or recurrence is concerned by a considerably less dose than is required to kill it. A deposit of living cells may be so starved and pinched through interference with blood supply and fibrosis that it is rendered harmless. The work of Ewing indicates that the beneficial effects of radiation in cancer therapy are more often attributable to these indirect effects than to direct destructive action.

It is with the hope of rendering harmless any microscopic deposits of carcinoma cells in the operative field and adjacent lymphatic

\*Read before the Louisville Society of Physician and Surgeon.



drainage areas that prophylactic postoperative X-radiation is employed. It should be begun as soon as possible after operation and should be rather intensive, just short of a dose which will cause pleural irritation or pulmonary fibrosis. This undesirable complication seen quite frequently some years ago during the first enthusiasm over high voltage therapy, is now chiefly of historical interest and can always be avoided by slight modification in dosage. It is my practice to give at six week intervals two series totaling one hundred and sixty per cent of an erythema dose over the entire area from mastoid to costal margin and from the opposite sternal margin to the opposite side of the spine. It has been our good fortune to see no local recurrences in the scar or adjoining skin areas in cases so treated during the past ten years. Recurrences, when there have been any, in these cases have been skeletal, pulmonary, abdominal or cerebral, but not local.

On theoretical grounds it would appear to be excellent practice, and the experience of those surgeons who have employed the method prove that it is, to bury fully screened radium or gold emanation tubes in the axilla, along the sternal margin of the ribs in the intercostal spaces, and perhaps below the clavicle at the time of operation. These applicators should be carefully placed; the dosage should be calculated by one thoroughly familiar with the physics and therapeutics of radium; and for the best results the application should be made routinely in all cases operated for carcinoma of the breast even if there are no visible or palpable deposits in the axilla. If radium element is used, a number of small applicators will be required containing amounts of radium on the order of 1.5 mg. to 5 mg. This type of radium application should not be considered to obviate the need for postoperative x-ray. It is suggested that for the operable scirrhous breast carcinoma today the ideal routine approach consists of:

- (a) Radical surgery
- (b) Radium or emanation placed as indicated in the wound at the time of operation even if the disease appears to be confined to the breast
- (c) Rather intensive postoperative x-ray.

It is generally considered that cases presenting at the first examination involved supraclavicular nodes, fixation of the tumor to the chest wall, chest or bone involvement (as determined by x-ray diagnostic examination) are inoperable from the standpoint of the radical operation performed with hope of cure. For this reason every patient with cancer of the breast should have the chest x-rayed before the course of treatment is decided upon. If there are any places sug-

gestive of early bone involvement, the suspicious areas should be examined very carefully with a view to ruling out such a possibility. Cases classed as inoperable for these reasons connected with the progress of the growth itself or for other reasons pertaining to the general physical condition of the patient should be treated primarily and entirely by radiation methods. Particularly in older, rather undernourished patients with slowly growing types of carcinoma, the prognosis as to cure in the inoperable cases treated solely by external radiation is not good, but the outlook as to relief of symptoms and recession of the growth is excellent, so that many of these patients may live out their expectancy and die of intercurrent diseases in spite of the existence of a technically inoperable breast cancer.

In patients who have had no postoperative radiation the most frequent type of recurrence is the carcinomatous nodule in the scar or in the skin adjacent to the scar, or, more rarely on the opposite side of the chest, on the abdomen, or even the thigh.

The individual nodule yields readily to adequate doses of either x-ray or radium. They should be treated because they are often painful and, if left untreated, tend to break down and ulcerate. Also their presence, though not menacing in itself, is filled with sinister significance to the patient and active treatment measures are necessary to her peace of mind even if there were no other reason for the vigorous attack.

Another common type of local recurrence is the invasion of the costochondral cartilage with production of a tumor mass of hard, almost bony consistency, frequently as large as the end of a lemon. They do not yield to treatment as readily as the skin recurrence but, if treated vigorously, are promptly reduced in size or driven away entirely and prevented from ulcerating. Occasionally these lesions may break down to the point of fluctuation so that there is a temptation on the part of the surgeon to open and drain them. Under vigorous radiation treatment, the fluid absorbs and the area again becomes firm.

Metastasis to the opposite breast which occasionally occurs is probably always best treated by radiation if either pain or rapidity of growth call for treatment at all since there is, of course, no outlook from further surgery under the circumstances.

Probably by far the most common metastasis is carcinomatous deposit in the spine or pelvis, more usually the dorsal or lumbar spine, but occasionally the cervical. We have among our cases one instance of pathological fracture with forward dislocation of the first cervical upon the second as well as several instances of metastasis in the dorsal and lum-

bar regions. Many of these patients have been treated successfully so far as the individual lesions were concerned. The involved bones can be caused to recalcify, the pain can be markedly relieved and the integrity and apparently the strength of the involved bone can be restored almost to normal. Naturally no hope exists of curing the disease after bone metastasis has occurred although apparently in occasional instances of which every radiologist of wide experience has one or two in his files, the disease does not return for some years. Any pain in the nature of "lumbago," sciatica, persistent low back pain, pain of any kind which might be traced to the spinal nerves and which does or does not conform to any of the common types of pain in that region should be assumed in a patient, who is known to have had a cancer of the breast, to be due to a vertebral metastasis and should receive the benefit of vigorous x-ray treatment even though no bone involvement can be demonstrated. X-ray diagnosis of bone metastasis depends primarily upon the loss of calcium from the bony structure and this must occur in considerable degree before it can be visualized in the spine. Consequently when the metastasis can be diagnosed by x-ray it is possibly, as metastases go, fairly old. Less commonly, bone deposits are seen in the femur and may produce pathological fracture; still less commonly the humerus and other bones.

Cerebral metastasis is apparently fairly common. It presents all the diagnostic characteristics of brain tumor. Radiation treatment, while hopeless from the standpoint of cure, will usually relieve the headache to some extent and may produce rather marked palliation. This depends in metastatic carcinoma as in primary brain tumors very largely on the radio sensitivity of the tumor.

Pulmonary metastasis is a fairly frequent, very distressing and usually terminal incident. There is believed to be little hope of even alleviating symptoms by radiation treatment; however, the distressing cough is sometimes checked; the dyspnea may be relieved for a time and, as in the case of other metastatic deposits, there appears in every large series an occasional case of an apparently cured individual who at one time had a pulmonary metastasis.

Late and usually terminal metastases may appear in the liver, in the uterus, and indeed throughout the entire abdomen.

Surgery alone apparently reached its limit in the attack on carcinoma of the breast some twenty or twenty-five years ago although, as is usually the case, statistics can be found to support almost any contention one wishes to make. It seemed evident from a study of large series of cases reported from

institutions of irreproachable reputation as well as from the personal experience of surgeons and radiologists that properly administered postoperative x-radiation has resulted in a material and considerable improvement in the number of five year survivals. It should be pointed out that there are at least as many possibilities of incompetent, inefficient, and consequently, more or less useless x-ray therapy as there are of incompetent or inefficient surgery. Much of the conflict in the huge mass of statistics on breast cancer no doubt results from the fact that cases were classified simply as having had or not having had postoperative radiation. Where statistics are taken only from workers or institutions where it can fairly be assumed that the radiation was efficiently administered, much of the apparent conflict disappears.

Of recent years the addition to the program of radium placed in the wound seems to have produced a further and definite improvement in statistics. This procedure has been followed to a greater and more general extent in England and upon the continent than has been the case in this country.

#### FORUM

##### WHAT OTHERS THINK OF US

Helena, Arkansas,  
April 22, 1932

Dr. G. G. Altman,  
Louisville, Ky.

My dear Doctor:

I have just read your article "The Difficulties in the Diagnosis of Empyema and Surgical Considerations" in the April issue of the Kentucky Medical Journal.

To my mind this Journal is the outstanding of all journals I have ever read. The articles were well printed and readable, the arrangement good, the variety of the articles were such as to appeal to every physician's and surgeon's need and taste. To me it is the most helpful medical magazine I have read recently for the general practitioner in as much as it was within his ability to understand and comprehend all the articles.

Major articles in the American Medical Association Journal are entirely scientific and over his head. I read the editorial about Dr. Gossett's book "What the Public Should Know About Childbirth." I ordered it immediately and it is excellent. But the title should be changed to what "The Doctor's Should Know and Does Not Know About Childbirth." It is well written book and should be in every doctor's library and waiting room.

Sincerely yours,

J. B. ELLIS, M. D.



# Kentucky Medical Journal

Published Monthly By

THE KENTUCKY MEDICAL ASSOCIATION  
IncorporatedEntered as second class matter October 22, 1906, at  
the Postoffice at Bowling Green, Ky., under act of  
Congress, March 3, 1879.Subscription Price .....\$5.00  
Edited Under Supervision of the CouncilOFFICERS OF THE KENTUCKY STATE MEDICAL  
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OCTOBER 3, 4, 5, 6, 1932

## COUNTY SOCIETY REPORTS

**Bourbon:** The Bourbon County Medical Society met Thursday evening, April 21st, 1932 at eight p. m. The meeting was held in the County Court Room in Paris.

The following memoes were present: Drs. J. C. Hart, C. G. Daugherty, J. A. Orr, J. T. VanSant, W. B. Hopkins, B. N. Pittinger, L. Oberdorfer, R. M. Blemker.

Visitors: Dr. Alfred Friedlander, Cincinnati, Ohio; Drs. Ernest Bradley, John W. Scott, Carl Fortune, C. A. Vance, J. W. Chambers, Darrah, Penny, Lexington; Drs. Martin, Reese, McDowell and Moore of Cynthiana. Dr. L. H. Henry of North Middletown and Dr. Calhoun of Millersburg.

The minutes of the preceding meeting were read.

The Society signed a list of suggested orders to be used by the Visiting Nurse, such orders to be followed until the physician arrives and makes necessary changes.

Dr. Alfred Friedlander, Cincinnati, read a paper on "Coronary Thrombosis." Illustrated by lantern slides.

The discussion was opened by Dr. John Scott, Lexington, and Dr. Ernest Bradley, Lexington. Followed by Dr. Carl Fortune, Lexington, Dr. L. R. Henry, North Middletown, Drs. C. G. Daugherty, J. A. Orr and closed by Dr. Friedlander.

Dr. Charles Vance, Councilor for this district made a short talk. Meeting adjourned.

MILTON J. STERN, Secretary.

**Harrison:** The Harrison County Medical Society held its regular monthly meeting April the 4th, at the Harrison Memorial Hospital.

Members and visitors present: Drs. McIlvain, N. W. Moore, Todd, Ball, Blount, Martin, Reese, Wood, Wyles, Carr, Wells, W. B. Moore, McDowell and Smiser.

Drs. Charles Dougherty, Orr and Stern, of Paris. Dr. Armstrong, Dr. Ray and Dr. Thompson of Lexington. Drs. McIntire and McKim of Cincinnati.

The meeting was called to order by the President, Dr. McIlvain and the reading of minutes of the last meeting was omitted.

Dr. McIntire read a paper on "Diagnosis of Brain Tumors," illustrated by lantern slides of specimens. Drs. Daugherty, Thompson and Scott discussed this paper.

Dr. McKim read a paper on "Don'ts in Urology." This paper was discussed by Drs. N. W. Moore, Scott, Daugherty and McIntire.

The meeting adjourned.

This was one of the most enjoyable and instructive meetings the Harrison County Medical Society has held in a long time.

W. B. MOORE, Secretary.

**Scott:** The Scott County Medical Society met on Thursday evening, May 5th, at 7 o'clock for their regular monthly meeting. The following members were present: Drs. H. H. Roberts, president; S. S. Amerson, secretary and treasurer; L. F. Heath, vice-president; D. B. Know, E. A. Anderson, P. H. Crutchfield, Chas. W. Stephens, A. E. Higginbotham, etc.

At 6 o'clock the members met at the Lancaster Hotel for dinner. This has been adopted as a regular event for each meeting. It brings the members together for a social half hour before the regular meeting. The dinner was quite a success and all enjoyed this most delightful affair.

Dr. E. A. Anderson read a paper on "The Prevention and Treatment of Cancer." This paper presented some very valuable suggestions and was most interesting, covering the field and laying stress upon the necessity of the periodical examination and careful attention of every condition that may lead to the most serious condition to which the world is now being afflicted. The paper was thoroughly discussed by all present.

The Scott County Medical Society is thoroughly awake and is doing splendid work, both medical and civic. The next regular meeting Dr. W. O. Claxon will present a paper on the subject of "Pyorrhea and Trench Mouth."

It is planned to have an "All Day" meeting sometime during the summer, with chicken dinner and all the "fixings."

H. H. ROBERTS, President,  
S. S. AMERSON, Secretary.

**Grant:** The Grant County Medical Society met at the office of the Health Department at Williamstown, Kentucky, April 20, 1932 with the following members present: J. W. Abernathy, J. J. Marshall, J. L. Price, J. D. George, N. H. Ellis, W. J. Zinn, C. M. Eckler, C. D. O'Hara and C. A. Eckler.

The Secretary being absent at this time, Dr. C. M. Eckler was elected Protem. The meeting was called to order by Dr. J. W. Abernathy, president.

The usual business of the meeting was dispensed with at this time in the Secretary's absence, and the topic of the evening "Rheumatism" was now taken up. Discussion was opened by C. M. Eckler, outlining the different types as, Acute Rheumatic Fever, Non-Specific Arthritis, various forms, and Gonorrheal.

Next Dr. J. L. Price talked on the Etiology, says almost always infectious. The streptococcus hemolytica nearly constant in all cases. He emphasized heat treatment, sun, electricity, and vaccine, cited the article in the Country Gentleman by Paul Dekruiff, stressing the activity of the streptococci hemolytic germ. Scarlet Fever, Rheumatic Fever, Child-bed Fever, Blood Poison,

Red Sickness of Russia and China, very prevalent, thousand dying annually, due to this germ. The point of election for entrance into the human body is the throat.

Dr. J. J. Marshall, thinks it one of the most important subjects before the medical society. He brought out the point of heredity playing a part in the role of this disease. He recommended numerous local applications in the inflamed area as analgesique balm for instance.

Dr. J. D. George's experience with vaccine has been satisfactory. He uses rheumatic serum put up by Parke Davis & Co. known as Phylacogens.

Dr. N. H. Ellis uses salicylic acid, one ounce in thirty teaspoonfuls of water adds soda to dissolve it, and give it freely.

Dr. C. D. O'Hara stressed heart complications in children and adults.

Dr. Abernathy stressed the importance of diagnosis and treatment and that it was not always easy. He uses sodium salicylate to the point of toleration, gives morphine and Codine for pain. He uses local applications especially liquid analgesique balm.

At this time Dr. C. A. Eckler arrived and read the minutes of the previous meeting and the communications and correspondence after which the program was continued.

Dr. Price reporting a case of rheumatism cured by removing the patient's teeth when everything else failed.

Dr. C. D. O'Hara gave a new line of thought to the Society on the subject of what the orthopedics formerly called flatfoot but now after studying thoroughly this condition they no longer used this term but signify weak-foot, because the condition exists at times when the arch is not broken and no condition of flatfoot exists, consequently the term flat-foot is a misnomer. This talk was appreciated by the Society.

Subject for next meeting, "Cancer As It Relates To The General Practitioner." Discussion opened by Dr. A. D. Blainee.

C. A. ECKLER, Secretary.

## BOOK REVIEWS

WHITE HOUSE CONFERENCE, 1930, A publication of White House Conference on Child Health and Protection: The key volume to all the reports of the White House Conference on Child Health and Protection. Contains the leading speeches delivered at the Conference and abstracts of the Committees' reports with their recommendations. An invaluable source book and guide for all those whose chief concern is the welfare of children. Board edition, 50 cents. Cloth edition, \$2.00. White House Conference on Child Health and Protection. Interior Building, Washington, D. C., Publishers.



# KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. 30 No. 7

BOWLING GREEN, KY.,

JULY, 1932

## THE PROGRAM

For two reasons it has seemed desirable to select and publish, in advance of the full program, subjects for discussion at the Eighty-Second Annual Meeting of the Kentucky State Medical Association, which will convene at the Brown Hotel, Louisville, October 3rd-6th.

In the first place, this affords members of the Association opportunity to choose the particular topics in which they are severally most interested and to familiarize themselves with the latest and best literature on the various subjects of their choice. Secondly, it is hoped, in this way, to encourage wider and more general discussion than would otherwise be the case. Observation and experience have combined to convince us that many people, who are averse to speaking extemporaneously, will willingly express themselves, if given time to familiarize themselves beforehand with the subject to be discussed.

Members of the Association who, while desiring to refresh their memories on any particular topic in the list published, are yet at a loss as to where to find the literature needed, would do well to consult the index volumes of the Kentucky Medical Journal and of the Journal of the American Medical Association. Both of these periodicals contain bibliographies dealing with almost every subject known to medical science.

At practically every annual meeting, there are in attendance members who talk, with authority and brilliancy, without seeming preparation. The truth probably is, however, that in the vast majority of cases hours of study have been devoted to the subject, previous to the discussion.

And this is as it should be. Even a case report, when accurately described, with each symptom carefully noted and recorded, becomes a permanent contribution to medicine. The Journal is always willing and glad to publish any such contribution from a member of the Association. In the medical profession, probably more than in any other, leadership can be retained only by that diligent application so necessary to keeping abreast the times. In no other profession is progress making such rapid strides, and, so, in no other profession is success so dependent upon keeping fully in step with this progress.

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The JOURNAL is the official organ of the Kentucky State Medical Association and its constituent local societies. Its pages carry, during the year, complete reports of proceedings of the State organization, including full text of all addresses made and all papers read. In its columns is also carefully chronicled every paper read before any of the county societies. Not a single one is omitted. In short, each twelve numbers constitutes an unabridged and authoritative record of the organized activities of the medical profession in Kentucky during the period covered.

The great bulk of the cost of this exceedingly valuable service to the physicians of the State is borne by the advertisers in the columns of the JOURNAL and the exhibitors at the meetings of the Association. For several years past, the gross income from advertising has annually almost approximated a sum sufficient to cover cost of publishing the JOURNAL, while fees from exhibitors at the annual meetings have largely contributed to defraying the expenses of these meetings, including full stenographic reports of the proceedings of both the general sessions and the House of Delegates.

It has always been and still is the policy of the JOURNAL to scrutinize carefully all advertisements offered for insertion in its columns. No advertisement is accepted until thorough investigation is made, both of the merits of the product offered for sale and of the reliability of the firm or individual seeking to advertise it. So scrupulously careful is the JOURNAL in this regard that it guarantees every article whose advertisement it carries and stands both ready and willing to reimburse the purchaser of any such article for loss incurred by reason of the article falling below advertised specifications.

These facts should furnish the members of the Kentucky State Medical Association a double incentive to patronize, whenever and wherever practicable, advertisers in the JOURNAL and exhibitors at the meetings of the Association. In buying from advertisers, they are protecting themselves against questionable products and, at the same time, minimizing the cost to themselves of maintaining their official organ, by increasing its advertising value. In patronizing exhibitors, they are not only assured of

products of approved value, but are, also, assuring that exhibits at meetings of the Association will continue to measure up to the highest standards of excellence and be of the largest possible variety.

Patronize your advertisers and exhibitors to the fullest extent of your needs in their respective lines and have the members of your families do likewise. Mention the JOURNAL in purchasing from either. Between you and them is a community of interest which neither can afford to overlook. In helping each other, you are both helping yourselves.

### AT THE CLUB

From over mountain peaks a stranger rode  
Posthaste, dismounting by that waiting  
door

Of his and mine and those who with us owed  
Good fellowship to men unknown before.

"Whence come you, fellow-stranger, host and  
guest?"

(Such trinity may often here be one)

"I come on mission from the stricken West,  
To ask again from Mam what Christ begun.

"My forebears climbed the heights with eager  
feet,

That inland spaces to our kind be free,  
And took with them the spirit of the fleet  
Which Spain's Armada met upon the sea.

"Yet Philip's power was impotence, compared  
With economic Titan threatening now  
The breed that never his ambition dared  
Again to strike. Undaunted is our brow.

"But Kent again *A Moi!* to Dorset calls.  
The cry resounds, Northumberland to  
Wales,  
As England, all, was summoned to her walls  
Against the moment when she saw those  
sails.

"So I am here. My sires pursued the sun  
Beyond its gloried setting, but 'tis gone—  
I turn to where it rises, knowing one  
For us shall be the sunset and the dawn."

Well come, my friend! I did not mean to be  
Inquisitive upon your steps. But, now  
That you have told, those days are brought  
to me  
Again. To you and to your guest I bow.

DUANE EDWIN FOX.

To Dr. Arthur T. McCormack,  
Cosmos Club, Washington, D. C.  
May 17-18, 1932.

### PUBLIC ADDRESS, ANNUAL MEETING

We are most fortunate in securing Dr. John Lovett Morse of Boston as our guest speaker for the meeting of the State Medical Association. Dr. Morse is the president of the newly organized American Academy of Pediatricians and has had about every honor that pediatricists could confer upon him. He is a delightful speaker with a keen incisive wit that brings the ready smile and yet he is very sane with that wholesome common sense that is so rare now and always.

It will be great privilege to hear such an outstanding man as Dr. Morse who has endeared himself to the Southern pediatricians by his many visits to the Southern Medical Association.

PHILIP F. BARBOUR

### COURAGE

To the new members of the profession, fresh from college and internship, the JOURNAL extends cordial greetings and hearty welcome.

You are entering a seemingly overcrowded field at a time of unprecedented economic depression and financial stress. The country as a whole is facing a situation without parallel in its history; in the South, conditions may be likened somewhat to those following the War Between the States and during the Reconstruction period.

In such circumstances, the pathway before you will not be an easy one to travel. The struggle will be difficult for a while, at least; but the present outlook should not be permitted to discourage you. When the present leaders of the profession in Kentucky shall have passed on, it is you who will then be called upon to take their places. To you from failing hands the torch will be thrown; yours to hold it high. The courage with which you face the problems of today, the fidelity with which you presently meet your obligations to the profession and to humanity will determine your fitness to assume and properly discharge the larger duties to devolve upon you tomorrow. The enviable position which the profession in Kentucky now holds, particularly in preventive medicine and public health, would not have been possible, had McMurtry, McCormack, Mathews, Gross, Yandell and other young men entering the field of medicine shortly after the close of the War Between the States, lost heart because of the conditions then obtaining. We as a profession are where we are today because they, during all the dark days of Reconstruction, faltered not nor doubted, but carried on with a loyalty and a courage which brooked no obstacles. We cannot too strongly commend them to you as exemplars.



## ORIGINAL ARTICLES

## UNUNITED AND DELAYED UNION OF FRACTURES\*

WILLIAM SNEED, M. D.

Surgical Department of Cornell University,  
New York City

Much has been written in regard to this subject and many surgeons have shown beautiful results in a vast number of cases by several methods of procedure. Due to over-enthusiasm or trying to emphasize the particular method that they have been using, they have largely failed to mention the bad results, or the pitfalls that one is liable to have by one or all of these methods combined.

In a discussion of this subject, we will endeavor to give you as briefly as possible, not only some of our good results but some of the troubles that we have had and stress some phases where too little mention has been made.

The skeleton is divided into long, short, flat and irregular bones. The long bones are the ones that we will discuss more fully. Fractures of the skull and of the face will not be discussed at all in this article and we will only make a few remarks about the short and irregular bones, such as the tarsal, carpal and spine. The tarsal and carpal bones in the main have a poor blood supply and, with the exception of the os calcis, a large part of their nourishment comes from the synovial fluid. In non-union of any of these bones, one of three procedures is indicated—removal, reforming and ankylosis, or a wedge-shaped bone graft, depending upon the pathological condition of the bone at the time of operation and as to whether it is feasible to save the bone, thereby maintaining cosmetic and functional results.

In a discussion of delayed union in the long bones, physiotherapy, weight-bearing, injection of calcium salts and dietary measures are resorted to and, as a rule, good results are obtained by all. We offer for your consideration a diet worked out by Dr. N. Kugelmass, who is associated with Dr. Fred Bartlett of New York at the Fifth Avenue Hospital and has also worked with me for several years at the Hospital for Ruptured & Crippled. We think that this diet and medication is of great value in both the treatment of delayed and non-union.

In cases of non-union, it is necessary that the cause be carefully gone into and a diagnosis of the underlying factors be made and in many instances, preoperative and post-



Figure 1

operative care is just as essential as the selection of the proper operation. In non-union of healthy individuals where a check-up is made from every standpoint; that is, blood, circulation, x-ray, etc., and where tissues appear normal in every respect, with the exception that the bones have failed to unite, a removal of the fibrosed bone and an overlay, inlay, periosteal bone chips or inter-medullary graft, depending upon the bones under consideration will, as a rule with immobilization in proper alignment, give excellent results in the hands of a competent man regardless of which method is used.

The circulation and position of the member should always be given careful consideration. We wish to mention several cases of different types which have come under our observation.

Case 1. A man 40 years of age, sustained a fracture of the lower end of the radius  $1\frac{1}{2}$  inches above the wrist. It was reduced within a few hours after fracture, maintained in position and was still in good position when first seen four months after injury. X-ray showed no callus formation. Fragments could be moved slightly and without pain. Wassermann was four plus. Active antileptic treatment was instituted. Bone operated upon three weeks after treatment was begun. The lower end of the radius was found to have undergone yellow

\*Read before the Jefferson County Medical Society February, 15th, 1932.



Figure 2

degeneration. The bone was soft enough to cut easily with a Bard Parker knife and while cutting, it felt like there were little grains of sand in the bone. The proximal fragment was apparently a normal bone. A sliding bone inlay was done, immobilization, anterior and posterior splint, diathermy and continued active antileptic treatment. Good bony union was obtained in ten weeks. There was no loss of function. This is one instance where syphilis was obviously the cause of non-union and we will admit that in our experience, syphilis rarely causes non-union of bone, except in tabetic or tertiary cases.

Case 2. A boy 12 years of age, gave a history of fracturing the right tibia at the age of 21 months. At the time of fracture, the child was apparently in excellent health, robust and strong, as per the mother's history. The fracture was reduced within a few hours, perfect reduction, no callus formation. Patient was in St. Luke's Hospital in New York for 2½ years. He had two closed and two open operations before coming to me some five years ago. Operated upon five years ago at the Fifth Avenue Hospital, with removal of a fibrosed bone which was so dense that it was hard to cut with an Albee saw. A sliding bone inlay graft with some spongy bone was placed in the dead space, afterwards immobilization and phy-

siotherapy, then a brace. Some evidence of callus formation. The mother allowed the child to walk without a brace and re-fractured the bone. Operated upon again by me at the Hospital for Ruptured & Crippled in December, 1930. Diathermy was given for four weeks before operation, special bone-forming diet mentioned above was instituted. At operation, the old scar was removed; site of fracture inspected; sufficient bone removed to get to healthy bone tissue above and below; a large bone graft was removed from the opposite leg; a considerable amount of spongy bone was removed from the upper part of the tibia on the opposite side; fibrous tissue and periosteum was conserved as much as possible so as to make a cuff over the site of non-union; the deformity was corrected before placing in the bone graft; diet was continued and diathermy was begun three weeks after operation. Brace was applied. A series of x-rays were taken every six weeks to two months and we will show some of these in lantern slides, showing that we have firm union with the bone as large at the site of non-union as at any other place except the extreme upper end of the tibia.

Case 3. This is obviously a case in which there has been marked endocrine disturbance. An osteotomy was performed on the right femur in 1922 for correction of deformity. The left femur was operated upon by Dr. Albee in 1923. This case was admitted to the Hospital for Ruptured & Crippled and put on traction, diathermy, manipulation and bone-forming diet. We were able to lengthen the limb two inches by traction in two month's time. Patient was operated upon October 20th, 1931. X-rays taken before operation looked as though there would be considerable fibrosis especially at the upper end of the lower fragment but no fibrosis was found. The bone bled much more freely than normal bone and more freely than usually seen even in the region of the great trochanter where circulation is more profuse than in any other part of the femur. A wedge-shaped piece of bone was removed and the deformity easily reduced. We were very careful to preserve a slight amount of the fibrous tissue on the inner side and the periosteum. In other words, the periosteum was not stripped up completely around the bone. There was considerable dense fibrous tissue and this was brought up in the same layer with the periosteum. When the femur was straightened, we had a good strong cuff of fibrous tissue. The lower end of the upper fragment was very soft, so soft in fact that we did not feel that an onlay graft would hold. Moreover, there was no part of the anatomy of this child where a good onlay



graft could be obtained. To remove such a piece of bone from the tibia, in all probability would have caused a fracture in this locality. There were razor-back shins present and a considerable amount of the anterior cortex of the tibia was removed over an area of about six inches and this was used as chips to place above, around, and below the site of fracture. Fair union was obtained in ten weeks and the patient could raise the leg off the table at that time. This case is still under treatment and we contemplate operating upon the left femur which has shown evidence of bone regeneration by treatment instituted and we feel it will be in very much better shape for union than the right was when operation is performed.

Case 4. An Italian woman, 28 years old, sustained a fracture of the right tibia four years prior to being seen. Examination showed non-union. There was a large scar on the front of the leg due to a compound fracture. This was operated upon four years ago, prior to the time I instituted pre-operative treatment of the type mentioned in the two cases above. As to whether that type of treatment would have been successful in this instance, or not, is doubtful. At the time of operation, we found a bone about one-quarter the normal thickness that was white and brittle up to the tibial tubercle. The medullary cavity did not bleed. There was



Figure 3



Figure 4. Right femur 8 years later now united firmly

fatty degeneration in the medullary canal. There were large globules of fat macroscopically. The cortex of the bone looked very much like an old egg shell that had been bleached in the sun. A large bone graft was removed from the opposite tibia and we found the bone on this side about one-half the thickness of that in a normal individual but apparently good healthy bone. We failed completely to get any union in this instance.

Case 5. Non-union of the neck of the femur. A man 56 years old; history of injury 18 months before being seen;  $3\frac{1}{2}$  inches of shortening. A modified reconstruction operation was performed with the exception that the head of the bone was reamed out and the cartilage used to cover the stump of the great trochanter. After reaming out the head of the bone, it looked apparently normal. The cartilage was bright and glistening and apparently normal in every respect. We obviously obtained early union of the ununited fracture to the remaining part of the head and cartilage. This operation was performed in June, 1923, and the patient has been under observation since that time. He is a librarian and for a good many years has walked to and from his place of business which is about  $1\frac{1}{2}$  miles. When last seen, there was evidence of arthritic changes and we instructed him to curtail his activities.

Case 6. A woman 56 years old, about 5 feet 7 inches tall and weighing 180 pounds, sustained a fractured neck of the femur. Seen by me three months after injury. History of having had slight pneumonia and emphysema with a non-compensating heart and the leg swollen to enormous dimensions from toes to hip. X-rays showed what apparently was rapid absorption of the neck of the femur. I advised a long leg brace with pelvic band and a crutch under the arm with a special soft traction anklet extending up the



Figure 5. Ununited fracture tibia of 11 years and 3 months duration, 5 major operations

leg, in order to get the patient up and out into the air and sunshine with as little discomfort as possible. The slightest movement caused severe pain. Patient was moved out into the sun daily. We thought there was little or no hopes of getting union and that all we could do was to make the patient more comfortable. I saw her three times and supervised the fitting and application of the brace and to my surprise she walked into the office six months later, feeling very well. Indeed, stiff wearing an ambulatory splint and she subsequently walked without a brace, with about one inch of shortening. This case is given to demonstrate what Nature does sometimes when pain is relieved and the patient is carried out into the sun. Pain produces shock. Relief of pain and sunshine revive hope, hence the result.

#### SUMMARY

I do not confine myself to any one operation. In the main, when feasible I use sliding grafts in the tibia; inlay, onlay, or intermedullary grafts on the femur; onlay grafts on the radius and ulna; onlay or medullary on the humerus; tibial or iliac grafts on the spine with bone chips and spongy bone as adjuncts. I have never used beef bone but many of my friends have. It is not allowed on my service for any type of graft, for the reason that I have always maintained that autogenous grafts were better than heterogeneous and they are easy to obtain from the tibia in almost any shape desirable. It takes only a few minutes more time and I am sure will give a higher percentage of cures.

From a dietary and medical standpoint:—the main object is to obtain proper assimilation of those substances that are conducive to the formation of bone and sometimes medication is beneficial as well as the aid

of violet rays and diathermy. Each individual is studied carefully and put upon a regime that seems best for that particular case. In the main, we follow the advice of our internists and pediatricians in this matter. We have made some studies of calcium, phosphorous and the chemistry of the blood, and the macroscopical and microscopical findings in the bone. Dr. Charles Stockard has kindly consented to take charge of the scientific investigation and we will endeavor to see if some light cannot be thrown upon both how to form bone in individual cases and also how to prevent bone from forming in others where we wish to do arthroplasties. There is but little to offer at this time and we will defer making any statement until a later date. We realize that the whole field has not been covered even from a standpoint of showing all types of cases, as there are numerous other phases that have not been touched upon in this paper but we offer you the cases for consideration in order to stimulate thought along this line. We have refrained from criticising methods of procedure; but will state that without removing the fibrosed eburnated bone that so often obtains and sometimes is as much as three-quarters of an inch thick on both the proximal and the distal fragments and in which there are no living bone cells, that we have been unable to obtain union and no method of procedure has been successful without preparing the operative field by removal of this fibrosed bone.

#### THE BONE-FORMING DIETARY

Calcifying dietaries accelerate bone repair. They consist of maintenance diets reinforced by nutrients that increase the assimilability of calcium and phosphate salts as well as their rate of precipitation from the blood into the bone structure. Metabolic studies have shown that the skeletal struc-

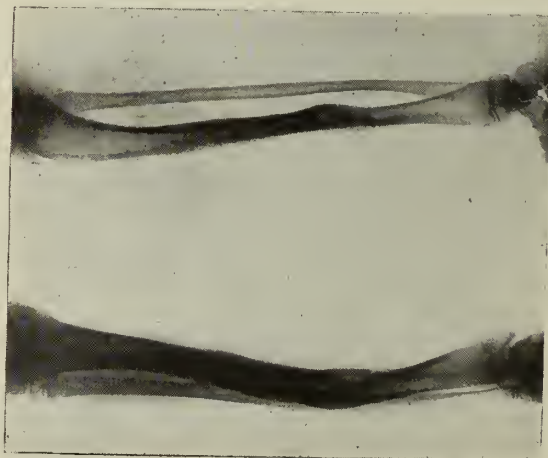


Figure 6. Postoperative December 1930 showing firm union





Figure 7. Case of ununited femur

tures are the first to be called upon to supply bodily tissues and organs with calcium and phosphate salts in emergencies. But when bone, the body's first reserve in these salts, becomes itself involved it has been demonstrated that the bone-forming requirements must be fulfilled in the daily dietary in order to obtain rapid repair.

Newer knowledge of nutrition has as yet inadequately revealed what constitutes a so-called optimum dietary for an individual, balanced and adequate in all nutrients necessary for optimum maintenance of body functions. Suffice it to say that each meal should be varied enough to include above and beyond what is considered a normal dietary, the following calcifying nutrients, acidified milk, 10 D cod liver oil, alkaline-forming foods (fruits and vegetable,) high visceral protein.

Acid milk at each meal is indispensable for two reasons. First, milk furnishes an abundance of calcium and phosphate salts and second, acidification of the milk with lactic acid, acetic acid or acidifying cultures reduces the buffer value of milk and makes the calcium and phosphate salts available for absorption into the blood circulation.

Vitamin D catalyzes the absorption of calcium and phosphate from the alimentary tract. It is best given reinforced in cod liver oil because its vitamin A content is a factor in tissue repair. It is most important to grade the dosage of 10 D cod liver oil in accordance with the level of intake of the total calcium and phosphate for the day for larger intake of these salts requires a corresponding dosage of Viosterol. The primary consideration is an adequate supply of calcium and phosphate salts and the secondary one is an adequate dosage of Viosterol in cod liver oil. In administering vitamin D

it is well to differentiate between the effects of Viosterol and ultra-violet light insofar as bone repair is concerned. Viosterol increases the gastric acidity and catalyzes the absorption of calcium and phosphate salts from the gastro-intestinal tract and accelerates the precipitation of these salts out of the blood system into the bone structure. But ultra-violet irradiation, particularly from the mercury vapor lamp accelerates precipitation of the salts from the blood more than it does in affecting the absorption of these salts from the alimentary tract. Both Viosterol and ultra-violet produce the same changes but differentially ultra-violet is to be favored in bone repair.

Alkaline-forming foods such as milk, fruits and vegetables favour bone repair; whereas acid-forming foods such as meats and cereal retard bone formation. Therefore, it is indispensable for each meal to be not only balanced adequately but also to be preponderant in fruits and vegetables so that the body ash may be alkaline forming, a condition that makes possible more rapid bone precipitation.

Visceral proteins are most effective in tissue repair. They are particularly indicated in bone healing because fibrous tissue formation is increased by ingestion of a high protein intake. Visceral proteins have the highest biologic value of proteins because they contain in balance the amino acids that are essential for tissue repair as well as the



Figure 8. Postoperative ununited fractured neck of femur



Figure 9. Fracture, both femurs, for correction of deformity

substances that stimulate blood and tissue constituents.

**Bone-forming Dietary—** Morning: Fruit; Mead's cereal; eggs; lactic acid milk.

Noon: Two cooked green vegetables; two raw vegetables; liver, kidney, heart, sweet-breads or brain; bone marrow on potato or brown rice, fruit.

Night: Two cooked vegetables; two raw vegetables; lactic acid milk; fruit.

#### DISCUSSION

**Mischa Casper:** From the pictures of one of the cases reported by Dr. Sneed, it looks to me like this patient has some kind of glandular disturbance. I would like to ask if any metabolic and pituitary tests were made on this patient. This may have nothing to do with un-united fractures; but I have had a few cases in which I thought glandular dysfunction played a very important part in the non-union of fractures.

Another thing, of which Dr. Sneed may not be aware, we have an abundant supply of lime water all over the state of Kentucky, springs and wells heavily laden with lime. This, I believe, is one of the reasons for our having less un-united fractures in this section of the country, and is one of the reasons for Dr. Hendon's splendid results in so many cases of bone work.

**G. A. Hendon:** I am very grateful, as I know everyone of us are, to Drs. Sneed and King, having come all the way down here from New York to give us this evening of entertainment and instruction. I am, also, grateful to Dr. Sneed for his kind words and the distinction of having him mention my name in connection with the work of non-union.

One of the phenomenas which I have noticed constantly in the non-union of bone that I would like to have Dr. Sneed discuss, is the following:

I am unable to explain it and I hope either Dr. Sneed or some member of the Society will enlighten me on this subject. To illustrate my point, I will exhibit four films, illustrating two cases; and to save time, I shall only show the antero-posterior views, although I have the lateral views if anyone cares particularly to see them. (Films exhibited). It is a non-union fracture of the middle-third of the femur in a girl 18 years old. It was nine weeks from the time the fracture occurred until she came into my hands. The patient had had a Lane's plate and a plaster spica put on elsewhere. The wound had become infected, and the plate was removed, so was the spica. When she came to me she not only had non-union, but a discharging sinus from the site of fracture. It can be seen by the film that the bones were undergoing a process of septic necrosis by the gnawed-out appearance of the fragments. There is no sign of callus, although it had been nine weeks since the injury. In contrast I exhibit a film taken three weeks after I put in a key and an abundance of callus can be easily seen in the film.

It is interesting to note in all cases that there is an excess of callus on the concave side of the bone and very little on the convex side. The point upon which I am seeking information, is why no callus ever formed before the bone key was used.

Now the other case is one of non-union in the middle-third of the femur that had existed three years and ten months. This patient had had three operations, and had spent twelve months in plaster-of-Paris. I show you this film which presents an artificial ball and socket joint in the middle of the thigh. No callus can be seen. The next film is one made three weeks after the introduction of the key, which shows ample supply of callus; the patient was able to get up and walk on crutches at the end of four weeks, and has since secured firm union.

We have done eighteen non-union cases and our periods of non-union vary from three months, to nearly four years. We have also done forty-four cases of fractures of the hip. In three of these there had been non-union. One four months, one seven months and one twelve months with prompt recovery in all. In operating by this method on fractured hips, the key can be inserted, patient placed in bed without immobilization and may assume any position that is compatible with their comfort. All that is required is ordinary courtesies of invalidism. In three weeks they may be allowed to sit up in a chair.

I cannot see the justification of plaster-of-Paris, and immobilization, when it is possible to do with my method in three weeks, what it takes three months to do by the methods commonly in vogue.

**W. Barnett Owen:** I have listened to the



papers of Doctors Sneed and King, with a great deal of interest. I have known Dr. Sneed personally for a number of years and have had the opportunity of seeing some of his work, which I can commend most highly. Some of the fractures which he has presented to us for consideration, are classed as the most difficult types of fractures which we encounter. Will illustrate further some cases of ununited fractures, which we have encountered, by lantern slide illustrations of x-ray films made before and after operation.

The first case sustained a fracture of the humerus, several years ago, about 6 inches below the shoulder, had had five subsequent operations before he consulted us; the first operation consisted of an intramedullary beef bone peg, remains of which can easily be seen in the proximal end of the humerus. There has never been any union following any of the operations and there is no attempt at healing, as there has been no callus formation. The last operation was performed by us three years ago which consisted of excision of the distal end of the proximal fragment and the proximal end of the distal fragment of the humerus. The medullary canal of the bone was thoroughly opened, the ends of the broken fragments were approximated, the periosteum split and dissected down the shaft on the outer side, large on-lay graft applied, as shown by the slides; also photograph of the man holding his arm away from his body without support after the operation, which follows the one beforehand showing a decided acute bend at the point of non-union. This, and the other cases that will follow, illustrate that it is possible that if these fractures had been treated by external fixation, without open operation, there is a possibility of union having taken place. Ninety-five per cent of non-unions which we have had in the past few years, have had primary radical open operation, immediately following the fracture. We have only had one case of non-union of the humerus which had not had some form of internal fixation by open operation.

The second point which I would like to emphasize is the fact that in the cases which have had one or more operations performed for non-union previously, and have had the massive on-lay graft done in the way illustrated by the lantern slides of these cases, is positive proof to us that this offers the greatest percentage of results in non-union cases of any other method with which we are familiar.

**Frank P. Strickler:** I have no lantern slides to show and will not take up much time. I believe that we will all admit that the final chapter on the various phases of bone reproduction has not been written as yet. Bear in mind that we have had two phases of the subject spoken on this evening. Dr. Owen has spoken on the routine treatment of non-infected cases.

Dr. Hendon has spoken on the treatment of infected cases which to say the least, is a radical departure from the present teachings. However, he has obtained results and that cannot be denied. I feel that the beef bone graft put into infected cases, acts very much as a foreign body or sequestrum, that it stimulates the growth of new bone, thereby producing a union.

There is one question I would like to ask Dr. Owen about the lantern slides of his massive onlay bone grafts. Why is it in his cases, that in spite of the massive onlay graft, he has no union at the sight of the fracture? I mean no new bone growth between the proximal and distal ends of the original fracture. The massive onlay bone graft seems to have bridged the fracture but not to have caused a union at the sight of the fracture. There must be some reason for this and I am wondering what it is.

**I. A. Arnold:** There has been quite a good deal said tonight both by the essayist and the discussions as to the cause of non-union in fractures. I believe that we can divide the cases of non-union into three classes—(1) systemic; (2) anatomical; (3) poor reduction and incomplete immobilization. As to non-union in the flat bones and the round bones I have found that union takes place readily if the fragments are approximated properly and maintained in that position a sufficient length of time. The most frequent places of non-union in fractures are in the humerus just below the insertion of the deltoid and in the lower part of the middle third of the femur, where the bone in both places is compact and the nourishment is poor. A little motion at the site of the fracture, as was formerly recommended by some excellent men, I think, is erroneous. The immobilization must be absolute, as the slightest motion at the site of fracture breaks up the newly formed osseous cells and fibrous union takes place. This accounts for the excellent results in beef bone pegs when properly applied, not that it stimulates osteogenesis but maintains the fractured parts completely immobilized at the site of fracture and, where there is considerable loss of osseous tissue, prevents the periosteum from tucking in over the ends of the fractured fragments which invariably will cause fibrous union by sealing up the ends of the bones. Systemic diseases such as typhoid fever or any diseases which lower the vitality of the individual necessarily interfere with osseous regeneration; but I have not found that syphilis materially interferes with union although the osseous tissue is bulky, soft and breaks easily.

**W. L. Sneed, (In closing):** Several of the cases shown were of the endocrine type. We have been investigating this subject for several years and are carrying on some experimental work at this time. Dr. Charles Stockard of Cornell has kindly consented to aid us in this investigation.

In all of the cases shown there were thorough physical examinations and chemical and other examinations of the blood. I have very little to say about this now. We began using a special bone-forming diet about three years ago and consider it of great value. We have injected some cases with calcium salts as advised by Dr. Ray Murray of the College of Physicians and Surgeons and consider it of value.

In regard to Doctor Hendon's cases of putting bone keys into infected cases, anything I might have to say would not be based upon experience. There is one condition that the bone key meets, and that is proper alinement and immobilization, which is very essential. The operation with immobilization and fixation obviously stimulates bone repair. Phemister of Chicago uses onlay grafts in all cases. We try to select our cases carefully and do the operation that seems best fitted to the particular individual. Care should be taken in all cases not to interfere with the circulation. Physiotherapy and careful post-operative care are essential if we expect to get the highest percentage of results.

We have been using autogenous grafts entirely, but after observing Doctor Hendon's cases I intend to use the bone key in selected cases.

The question is often asked as to whether bone transplanted, lives. To substantiate that, even a whole bone may live when completely removed from the body. I reported a case in 1919 of an astragalus that was completely dislocated. When the skin was incised it was found to have no attachment whatsoever. There was a fracture of the external malleolus also. It was completely removed, put back in position, and a deformity of the foot reduced. The patient was operated upon September 20, 1920. The circulation of the astragalus was investigated and we thought that we were the first to work out the circulation of the astragalus, but found that a German used quicksilver in 1880. I was criticized severely by numerous orthopedic men at one of our meetings stating that the bone would not live but would degenerate. The patient was seen a few months ago and is still walking upon that foot as well as a normal foot.

Doctor Owen asked the question in regard to the Brackett operation and how the operation I performed upon the hip differed from Brackett's and Whitman's operation for un-united fractures of the neck of the femur. Brackett freshened the surfaces and put raw surfaces together, the neck and the head. Whitman takes the head of the femur out entirely. In our cases where the cartilage of the head of the femur was intact, we reamed out the head and forced the stump of the neck and trochanter into the reamed out head of the femur. The reamed out head of the femur unites to the neck and comes nearer, making a normal joint that can not be made in any other way, as we have two cartilaginous

surfaces opposing and preventing as nearly as possible arthritic changes. We also noted after Whitman's operation that there was a tendency to adduction and flexion deformity. For this reason we have lengthened the iliopsoas muscle.

In this way we can easily obtain abduction and, as there is very little tendency to flexion deformity, in many of the cases shown by Dr. Owen, the bony structure was apparently normal and it was easy to obtain good results. In doing operations as advised by Doctor Hendon I shall use a little more immobilization than he does, and shall protect them later by braces until firm union is obtained.

In the upper end of the humerus fractures of the cervical neck or anatomical neck with displacements, we have used the long head of the biceps as advised by Doctor Nicola for recurrent dislocations of the shoulder.

Summary: Carefully select the operation for the part and patient that seems best fitted in that particular individual and case. Take care of your circulation, alinement, and mobilization with stimulation by diet and physiotherapy until union has occurred.

**Incidence of Myocardial Infarction.**—In 1,000 unselected consecutive postmortem examinations more or less localized myocardial infarction was recognized grossly by Barnes and Ball in forty-nine subjects (4.9 per cent). Of 685 of these subjects, 40 years of age or more, myocardial infarction was observed in forty-seven (6.86 per cent). A majority of the subjects who had sustained myocardial infarction had had associated hypertension, as judged by the cardiac weights and the records of blood pressure. Notable preponderance of arteriosclerosis in the left coronary artery over that found in the right was not observed in the hearts in which evidence of infarction was found. Gross myocardial infarction resulting from coronary occlusion was practically confined to the left ventricle. Myocardial infarction was observed in the posterior basal portion of the left ventricle in twenty-four instances as compared with twenty-eight instances in which it involved the apex and anterior portion. More careful pathologic study of the posterior basal portion of the left ventricle is urged in order that infarctions in that region be not overlooked. In twenty-eight instances infarction occurred in the region supplied by the anterior descending branch of the left coronary artery, as compared with twenty instances in which it occurred in the region of the left ventricle supplied by the right coronary artery.



## TREATMENT OF BRAIN ABSCESS\*

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Although this paper has to do with the subject of the treatment of brain abscess, it is well to state that differentiation must be made between a brain abscess and an epidural abscess, or a reaccumulation of pus in an operative site associated with a mastoid, frontal sinus, or any of the accessory sinuses. This is not always an easy distinction to make.

Without going into the subject of differential diagnosis at this time, I wish to advise that any intracranial procedure which might be done for the localization and drainage of a brain abscess be deferred until the associated area in question, for example, the mastoid, frontal sinus, ethmoids, or sphenoids, be eliminated as a possibility of provoking the signs and symptoms which might simulate an intracranial lesion. Recognition of this fact has prevented an otherwise useless and possibly dangerous procedure, while failure to recognize this fact has resulted in a reversal of procedure, exploring for an intracranial lesion which did not exist, and later followed by eradication of the extra-dural lesion itself, with recovery of the patient.

## TYPE OF ABSCESS

Furthermore, in discussing the treatment of brain abscess it is well to define the type of abscess with which one has to deal. In this paper discussion of multiple metastatic abscesses associated with systemic infection will be eliminated. Also massive septic encephalitis associated with a high elevation of temperature, and a possible or probable associated meningitis is likewise eliminated for the reason that these cases, in my opinion, should not be operated upon, but operation should be deferred until the acute symptoms abate. It is believed that operation in the majority of such cases will have a fatal termination. Although in these cases which present a picture of severe gravity, and in which pressure is brought to bear upon the surgeon by members of the family and the family physician to give relief by operative procedure, it is advised that such a procedure be deferred until the severe symptoms have abated and a certain degree of chronicity has become established. Therefore, the group of cases to be considered in this paper is for the most part that of the chronic, well-defined sub-cortical, single abscess resulting from an extension of infection from the accessory sinuses. This abscess may be of long stand-

ing and produce symptoms only as a result of exacerbation of an infection in the abscess itself. If this be the case, it will be encapsulated with a rather dense capsule. However, in other instances of rather long standing there may be practically no capsule present, or if one is present, it may be quite thin and not well defined. Whether these be of long standing or not they may produce rather similar symptoms, i. e. those from compression involvement of the motor area by extension of the abscess itself, or the surrounding oedema, etc. but in which the elevation of temperature is not marked, being from 99.5°F. to 100°F. or 101°F. These are the favorable types of abscess for operation whether it be frontal, temporo-sphenoidal, or cerebellar, the ones most likely to give favorable results, and the ones which are to be considered in this paper. The post-traumatic abscess, which is entirely another matter, should not be included in this subject, although the principles which will be advised will be applicable to this type of abscess as well.

In reporting one's operative results the type of abscess dealt with should be explained so that the statistics will be more accurate.

## METHODS OF PROCEDURE

One of the first (and I consider the most important) contribution on this subject is that of MacEwen in 1893. In this masterpiece MacEwen advises rather wide opening of the abscess cavity with either removal of, or turning back of the peripheral brain tissue so as to allow of inspection and cleansing of the abscess cavity.

He states: "Once the opening in the cerebral tissue has been sufficient, the sloughs are then extruded by the intracranial pressure and are carried slowly to the surface of the brain. It is important to remove these sloughs thoroughly for if they remain they are apt to set up fresh irritation and abscesses in other periphery by the infective matter which impregnates them and which is contained in their interstices. The retention of such sloughs is one of the most fruitful sources of reproduction of abscesses after evacuating the primary one, and is also the cause of delayed healing. The leaving of cerebral sloughs is as dangerous as not eradicating the primary source of the infection or the channels by which it spreads to the brain."

MacEwen advised the use of boracic, or weak carbolic watery solution. He further states: "After evacuation of an acute abscess, drainage tubes are (for the reasons stated) of little value provided the whole of the infected matter has been removed."

In other cases he advised the use of an absorbable, decalcified chicken bone drainage

\*Read before the Jefferson County Medical Society, February 15, 1932.

tube which was introduced into the abscess cavity so that its inner end projected just within the outer wall of the abscess cavity, and sutured the drain to the scalp. So far as I am able to determine, his results are the best ever recorded.

Eagleton has advised the osteoplastic flap so that thorough inspection of the cortex can be done. When the abscess is localized, however, he advises draining it with a tube through a small incision in the dura. Mosher and Cahill have advised the use of the Mosher wire gauze cone as a drain, which, if I am not mistaken is inserted at the most dependent portion of the abscess cavity. The use of this drain necessitates making a fairly large opening in the skull so that the drain can be inserted into the abscess cavity. With the collapse of the abscess cavity about this drain it is believed that the drain is eventually extruded followed by some degree of herniation of the floor of the abscess.

Sachs advises the use of a rubber drainage tube. Bagley and Dean do the same. Dandy advocates in the case of chronic abscess only, the mere tapping of the abscess either once, or two or more times as the occasion requires. He states:

"A small perforated opening is made in the bone over the abscess where it appears to be nearest the dura. A ventricular needle is introduced into the abscess through a tiny nick in the dura. The needle is left in place until pus ceases to drip. The abscess is neither aspirated nor irrigated because of the paramount desire to avoid stirring up the infection by either mechanical or chemical stimuli. The cutaneous wound is tightly closed."

Coleman advises what he considers the simplest method of drainage done under local anesthesia through a trephine opening in the skull and with a dural incision of about an inch. He states: "The veins of the cortex are avoided and a search made for the abscess by a large ventricular needle over which a canula is placed. The abscess cavity is generally recognized with very little difficulty, because it imparts to the palpating needle, in most cases, a very definite sense of resistance. If the direction of the needle should be oblique, when the abscess capsule is encountered, an effort is made to approach the abscess more directly by a second trephine opening. When the point is discovered where the abscess lies nearest to the skull (and it may require two or three trephine openings to determine this), a ventricular needle is inserted into the abscess cavity, and the pus is caught by a suction apparatus as rapidly as it appear in the needle. After a slight reduction in the tension of the abscess by withdrawal of pus, a small soft rubber catheter is inserted through the track of the

needle into the abscess cavity. The flow of pus through the catheter is the test of a properly placed drain. If difficulty is experienced in placing the catheter in the abscess cavity, the needle is again inserted and as much pus as possible removed, though aspiration is not practiced. The wound is then closed, and in about a week the abscess is again tapped and a second effort made to insert a catheter. This may have to be repeated several times before the catheter is satisfactorily placed. If the abscess is reached at a considerable depth, say 4 to 5 cm., the canula is sometimes pushed over the needle into the abscess cavity and allowed to act as a drain. A soft rubber catheter, once properly placed, should be allowed to remain until extruded by healing of the abscess."

He reports that "fairly satisfactory results have been obtained" in his series of twenty-six cases of sub-cortical abscess. He states further, however: "We have not been willing to discard the drainage tube in every case." I believe that the Coleman procedure in dealing with cases of deep-seated abscess is to be preferred to any other with which I am acquainted. Although I have had no personal experience with the simple tapping procedure used by Dandy, it seems to me to be logical to assume that when an opening is made into the abscess cavity through its capsule, there is likely to be leakage of pus through this opening into the surrounding brain tissue and a secondary encephalitis, or abscess, might ensue. This probably would hold true in those cases in which repeated unsuccessful attempts are made to insert a rubber catheter into the cavity.

In any type of operation in which a residual abscess wall or drainage tube tract remains, there is at least a possibility, even a probability of this residue acting as a focus of latent infection which may give re-percussions at a later date. Recoveries have followed the use of any and all procedures which have been devised for the treatment of brain abscess, and I am thoroughly convinced that one should use that procedure which in his hands has given the best results.

In papers read by me in 1924 and 1925, and in discussion of the Symposium on Brain Abscess at the Annual Meeting of the American Academy of Ophthalmology and Otolaryngology in 1929 I have recommended an operation which provides for a rather wide opening into the abscess cavity, and which allows a full inspection and cleansing of the inside of the cavity. Relief from the marked intracranial pressure and eradication of the abscess cavity are due to herniation of the cavity from within the intracranial space. Progressive healing of the wound continues



after formation of the hernia cerebri with proper Dakinization, and the hernia gradually subsides leaving a non-hair-bearing scar which is readily removed by a minor plastic operation under local anesthesia. This procedure has been applicable to abscesses of various sizes (although none of them were small), and is applicable for any abscess whose outer wall approaches to within about 2 or  $3\frac{1}{2}$  cm. of the skull except those situated at the base and quite distant from the periphery where no opportunity affords itself for herniation. This procedure is not confined to small abscesses located on or very near the surface of the brain, as has been believed by some no doubt as a result of two or three sketches which appeared in my original article. These indicated that the abscess was located more superficial than was intended.

At the meeting of the Academy in 1929 I proposed the use of silver wire baskets in certain cases in which one, after careful inspection, feels fairly certain that no other extension of the abscess, or a secondary abscess, exists. This wire basket, which is made in two different lengths and three sizes has as its advantages, the following:

1. It prevents the collapse of the abscess cavity after evacuation, with a possible reformation of a secondary abscess.

2. It allows of proper dakinization of the interior of the cavity.

3. It serves to "conduct" the abscess cavity slowly out of the intracranial cavity to the periphery.

4. It prevents over-herniation, and shortens the period of wound healing.

It is preferred that the abscess cavity, if no leakage has occurred at the time of the original operation, be widely opened by removal of its most presenting portion 24 hours after it has been exposed. This allows for the cortex of the brain beneath the dura surrounding the opening in the bone to become fixed to the dura and thus prevents spreading of infection into the sub-dural space. After the abscess has been opened with the electro-surgical knife and the contents have been removed, and the interior of the cavity thoroughly inspected, the basket is inserted and fixed preferably to the outer table of the skull with silver wire which is twisted short so that the top of the basket reaches just beyond the surface of the pericranium. Over an interval of two weeks the silver wires are untwisted and then again twisted so as to leave that portion of the wire which fixes the basket to the skull longer than at each preceding time, which allows gradual, slow, and controlled herniation of the cavity from the skull. After several days the floor of the abscess cavity has been allowed to reach the periphery by herniation and the basket is

completely removed, herniation ceases, and the scalp flaps are sutured over the area. A small short rubber drainage tube is placed at all angles of the incisions, and these are removed after 48 hours.

By use of the basket over-herniation can be prevented, while at the same time the hoped for results, i. e. elimination of the abscess cavity, can be obtained, and the time of recovery thus shortened.

In a recent case the silver wire basket was successfully used in conducting a rather deep frontal lobe abscess out of the intracranial cavity which probably could not have been accomplished by any other means. This abscess cavity was located between the anterior portion of the lateral ventricle and the mesial aspect of the frontal lobe, and was situated nearer the base of the skull than the vault. It is believed that some of the cases operated upon by Mackewen healed as a result of herniation of the floor of the abscess outward through the defect in the skull, or to within a very short distance from the bony opening. No doubt, herniation of the abscess cavity has occurred at sometime in the experience of most operators for this condition and has been followed by recovery. It is further believed that in the majority of cases in which the Mosher drain is used, obliteration of the abscess cavity is produced by herniation, but probably to a less degree than has been advocated by me.

In conclusion, I wish to reaffirm the statements made by me in 1929, that one should be prepared to use whatever method is best suited for the individual case; but that in all cases in which it is possible, eradication of the abscess cavity by herniation should be done so that a residual potential abscess, or recurrence of an abscess in the brain is prevented.

## DISCUSSION

**Mischa Casper:** I would like to ask Dr. King why it is that he does not use the rib for his plastic work instead of using the tibia, in building out this frontal ridge. The rib fits itself very nicely about the edge because it is of a bony nature and has a rounded appearance, that is, it maintains the contour, and you can not get this rounded appearance by the tibial graft.

I have used the rib a few times and obtained very good results, as well as that rounded appearance of the forehead and over the supra-orbital region.

**B. F. Zimmerman:** I have been deeply interested in Dr. King's paper. I have not done an extensive practice in this class of work, but am of the opinion that Dr. King's results are to be attributed to the sound principles upon which his work is based. Those principles which he has emphasized are:

- a. Do not operate for abscess in the presence of a well developed meningitis.
- b. The eradication of the primary focus of infection, such as mastoiditis, frontal sinusitis, lateral sinus thrombosis, etc. before operating the abscess.
- c. Allow sufficient time to elapse pre-operatively so that the acute symptoms may subside and a protective wall be formed around the abscess.
- d. Adequate drainage and sterilization of the abscess cavity.

I have had no experience with Dr. King's operation. Most of the cases that I have had have been treated like the Coleman operation. We have had patients who apparently had recovered, to develop secondary abscesses, which it is believed were the results of inadequate drainage.

The nearest approach to the operation described here, which I have performed on two cases with recoveries, consisted of incising the cortex and then instituting a drain similar to the old Mikulicz's drain for abdominal suppurative conditions.

It seems to me that the wire basket has advantages over the above method and in suitable cases it would seem an excellent method to secure adequate drainage.

**Franklin Jelsma:** I have listened to Dr. King's presentation with a great deal of interest. I noticed a previous article, published in 1929, at which time he reported the treatment of six cases of brain abscess by the method he has described; his results were quite favorable. As he has stated, his procedure lends itself especially to the treatment of chronic abscesses.

In consideration of the general treatment of brain abscesses, it is well to first determine the source of infection, the portal of entry of the organism, and take active steps to eradicate any primary inflammatory processes. If the patient's condition will permit, it seems preferable to delay any direct attack upon the abscess until it is well walled off. Most abscesses, however, are chronic before one has an opportunity to see the patient.

Considering the abscess to be chronic, the operation of choice is determined by the patient's condition, by the particular lobe the abscess is located in, by its depth in the brain, and the thickness of the inflammatory wall surrounding it. Using the clinical findings as a guide, the abscess can be aspirated through a small burr hole, with little danger of spreading the infection. A small amount of air is then introduced and stereograms taken. From these stereograms, the necessary details, such as the depth, the extent and the closest point of the abscess to the surface, can be determined. With this information at hand, the operation of choice may be made through the most desirable region;

that is, the place where the abscess is closest to the cortex.

I wish to mention a method that may be employed in eradicating chronic abscesses near the surface: Through a small opening rongeuired in the skull, the cortex is incised over the abscess, the wall is grasped and incised and then sutured to the galea. This provides direct drainage and also an avenue through which the abscess wall can soon marsupialize itself. The simple procedure or repeated aspirations of the abscess through a small opening in the skull, has given good results and may be quite sufficient in many cases.

Regardless of the operative procedure adopted, one should always be sure that the sub-arachnoid space is sealed off at the site of operation, also that the ventricular system is not by any chance contaminated.

Dr. King has mentioned the utilization of tibial grafts to repair the skull defects. Various substances have been used in the form of plates, celluloid, particularly, has been quite satisfactory.

**J. E. J. King,** (in closing): In a way, I think I should offer an apology for reading a paper on this subject before a mixed audience just because I happened to be interested in it. I wish to thank you for your attention in listening to what I have had to say, and I would like to quit here and thank the gentlemen who have discussed my paper. However, I wish to say a few words in closing in reply to inquiries brought up during the discussion.

Regarding the rib graft of which Dr. Casper spoke: I wish to say that I have had no experience with these although they have been used a number of times. The rib graft probably gives a good result. Just whether it unites firmly with the skull or not is not known. I use an osteo-periosteal transplant from the tibia and have in a number of cases, and found that it gives good results. Dr. William Rogers and I had one case in which this operation had been performed and the patient died for some reason not known, about three years later, and he was seen by us in the morgue at Bellevue. Dr. Charles Norris removed the skull cap and found that the graft had united firmly in position in the defect, showing a line of union like the bottom of a tomato can both on the inside and the outside of the skull. All kinds of material have been used for closing these defects. Frazier, Coleman and I first used rather thin grafts from the outer table of the skull, but later gave them up for the reason that it made a thin area in the skull. Also some of these grafts absorbed on account of the thinness of the bony portion of the graft. I understand that Coleman now uses a perforated celluloid plate and reports that he has had good results. I have never closed any defects in the presence of a retained foreign body. We have never lost any of the



grafts except on account of infection, in which the defect was closed too soon after an infected wound had healed. In such infected cases I do not think a cranioplasty should be done for at least a year or more following healing of the wound.

I want to thank Dr. Zimmerman for his discussion.

Mosher and Cahill prefer draining the abscess through its most dependent portion by means of a wire mesh cone called the Mosher drain. It is believed that the abscess cavity tends to herniate and closes around this drain, and as the drain is removed, or after its removal, slight herniation takes place, thus accomplishing the same effect which is anticipated in my procedure but to a less degree.

Dr. Jelsma spoke about the organism found and the location of the abscess. The organisms present in the cases reported tonight were either staphylococcus or streptococcus, there were no cases of pneumococcus. As far as the location of the abscess is concerned in the use of this procedure, I consider that it makes but little difference provided herniation can be accomplished. It goes without saying that such a procedure is not advised for an abscess located at or near the base of the brain. All of the abscesses reported tonight were rather large and extended to within  $1\frac{1}{2}$  to 3 cm. of the surface. Coleman states that in the procedure which he uses, and in all of the rest with exception of the one which I described tonight or where the entire capsule is removed, there is a possibility of recurrence. Coleman has reported some very good results. Just how long these cases have been followed, I do not know, and whether or not further trouble ensued is not known.

There was one case which we had during the army service in which an abscess had supposedly healed by drainage with a tube, in which case the patient was up and about and apparently well. He was struck on the head one night, and the next morning while sitting up he fell back unconscious and died in about 36 hours. Autopsy revealed a residual abscess cavity with a very dense thick wall with the exception of one point where it had ruptured into the ventricle. This is the case in which the lantern slide was shown earlier in the series. The prevention of leaving such a residual cavity in the brain is another reason for my use of the procedure as described. Dr. Jelsma spoke about marsupializing the abscess cavity. Any abscess which is marsupialized eventually herniates, or reforms; therefore, I prefer to control the herniation by the procedure described instead of leaving it to chance. I again want to thank you.

## SYMPOSIUM: NEOPLASMS OF THE URINARY BLADDER

### DIAGNOSIS OF BLADDER NEOPLASMS\*

JAMES R. STITES, M. D.

Louisville.

Neoplasms in the bladder have been the subject of much discussion for the past few years and there is still no absolute satisfactory method of treatment. These tumors are rather frequent and their early diagnosis is our one hope for cure, as is true of tumor growths everywhere.

Bladder tumors occur far more frequently than tumors in other portions of the urinary tract, the ratio being about five to one.

The actual diagnosis of tumors of the bladder is comparatively simple since the improvements in cystoscopes and other diagnostic methods, once the patient has been brought under observation; but after the diagnosis is made it is rather a difficult problem to decide what is the best method to pursue for cure.

I would like to review briefly the more important of the clinical symptoms of bladder neoplasms. First and foremost, is, of course, hematuria. It may be either painless or painful, depending largely on the severity of the hemorrhage and whether clots are formed; if clots are formed, difficulty in urination is present, otherwise the patient may have no sense of discomfort. Of hematuria, more will be said later.

The second symptom is pain. I am not referring to the pain that comes from a tumor which has metastasized and patient is already doomed, but to the early cases. As to whether or not there is pain, depends upon two things—(1) where the growth is located, and (2) how much infiltration there is into the bladder walls and adjacent tissues. Tumor growths located around the internal sphincter of the bladder, give rise to considerable pain and with it an associated terminal hematuria. It must always be remembered that terminal hematuria can be from a neoplasm as well as from a severe posterior urethritis. Pain is always present in the rapid-growing sessile growths which occur on the base and over the trigone of the bladder, for they are rapidly infiltrating types of growths and interfere with the contraction of the bladder musculature.

I would like to say a few more words in regard to hematuria. It is the most important of all urinary symptoms and I regret to say the most neglected and maltreated of all urinary symptoms; and if we are to even hope for cure of bladder tumors, then at the first sign, which is almost always bleeding, we should think of neoplasms and we should not stop in our search for the source of

\*Read before the Jefferson County Medical Society

bleeding until that cause has been determined. In a recent series of seventy-three cases of tumor of the urinary bladder, the cardinal symptom was hematuria and the average duration of this symptom was three years; and I regret to say that many of these seventy-three cases had been seen far earlier by their physician. Hematuria is nature's warning to us and if we do not exert every effort, then we have not done our part to help eliminate the greatest curse of mankind. If it is a tumor growth, it can almost without exception be eradicated by a far simpler method in its early stage.

By cystoscopy there are several things of great importance to be learned in our prognosis and treatment.

I will not attempt to classify bladder tumors as to their pathological makeup, but confine my classification of them simply to what they mean from a clinical standpoint as viewed through the cystoscope.

It is true that there are many benign growths in the urinary bladder, but they must all be treated as potential malignancies. I shall make no differentiation of tumor growths as to whether they are benign or malignant, but will consider them solely from the standpoint of treatment and prognosis. Roughly, they are divided as follows: (1) Pedunculated growths, which may be multiple or single. (2) The sessile types of growths, which in truth may also be many small, pedunculated growths closely grouped.

The small, pedunculated tumors are very frequently benign papillomas and their location and size is the determining factor as to what method of treatment to pursue. This type of growth, as said, may be multiple or single. If malignant, they are of low-grade but tend to recur rather rapidly and finally undergo definite malignant changes which lead to the important point as to what is the wise procedure for their absolute cure even if they are definitely benign when first seen.

The second type of growth, the large sessile tumor, is always malignant and usually rapid-growing. They are usually found in the base of the bladder, often involving one or both ureteral orifices, and the bladder neck. To this type of growth should be given our most careful consideration, for the results of the various treatments at this time of this type of growth are very unsatisfactory and their occurrence is far too common to be ignored.

All true neoplasms, especially those that are to be treated by cystoscopic means, should have biopsies. It is beyond the scope of the human mind and eye to say that any growth in the bladder is benign or is malignant, when viewed through a cystoscope, and there is no way except by careful microscopic

section of all the pieces removed for biopsy that we can best advise our patients as to treatment, for the safest and surest way for their recovery, even though it be radical. In the large, sessile growths where open operations of one kind or another are to be employed, no preliminary biopsy is necessary except that it would be of tremendous aid to the surgeon should he know the type of growth he is to handle before surgical treatment is attempted. In the larger growths, pieces should be removed from different portions of the tumor, for it has been definitely shown that a neoplasm may present one type of growth in one portion and be malignant, yet a section from a distant portion of the growth will be entirely benign. This has led to the belief that these growths are sometimes many small, pedunculated growths closely linked.

There is another type of bladder neoplasm which is rather difficult to diagnose, and unfortunately gives very few symptoms, in which an early diagnosis is rarely made. That is the type of tumor found more often in the dome, which seems to involve the intramural portion of the bladder, the peritoneal reflection and adjacent intestines. There is usually only a small ulcerated area present in the bladder mucosa, this often being obscured by the air bubble. Diagnosis is extremely difficult and the true pathology can not be determined until surgery. At times, this hard, indurated mass can be felt suprapubically.

There is one more point, and an extremely important one, in the diagnosis, prognosis and treatment of bladder tumors, which is cystography. Nothing can be of as much assistance to us as cystograms. They give us information as to the size, amount of involvement of the bladder itself, and most important, the amount of infiltration that has occurred. With exception possibly of the small, single, pedunculated growths, I think it is of great importance to view all bladder tumors by x-ray either with injection of air or radiographic solution. As to which is the better, there is much discussion, but much can be gained by employing both in every case of bladder tumor.

Many growths when viewed through the cystoscope involve only a small area, but when cystograms are made it is found that this growth involves much more of the bladder wall than we imagine from local observation alone.

I will not attempt to make a summary of my paper. I simply urge that we always be on the lookout for urinary symptoms which may be a guide to the early diagnosis of bladder neoplasm, and urge that all be done to hasten the diagnoses of tumors. We can



offer so much more hope for cure if we see these cases in their early stage, for as we all know, bladder neoplasms are slow to metastasize and early intervention prevents the patient living a life of misery with no hope for relief except by extremely radical procedures which are far from satisfactory.

## TREATMENT OF BLADDER NEOPLASMS\*

JOHN T. BATE, M. D.

Louisville.

Many seem to believe that the early diagnosis of malignant disease of the urinary tract is not only possible but frequently made. That this is by no means the case may seem strange in view of the widespread and skillful use of various diagnostic instruments such as the cystoscope, ureter catheter and x-ray. As a matter of fact the difficulty lies not so much in the inadequacy of these instruments or in the lack of skill in their use, as in the fact that malignant disease of the urinary tract may and often does give no symptoms whatever until it has progressed to a point where its complete and permanent removal is either doubtful or impossible. This desperate situation may be encountered by the doctor at the time of the patient's first visit. (1)

While this seems to be an excellent argument for routine annual or semi-annual physical examination, the finding of an occasional red blood cell in the urine would rarely convince the patient and examiner that a complete cystoscopic examination should be done. So we can look forward to little improvement in the time of diagnosis, so while making the best of these means of therapy at hand, should strive constantly for improvement in the administration and to find new methods of treatment and prevention.

Although Broders' method of grading tumors into four classes, according to the degree of malignancy, as estimated under the microscope, has been applied to the bladder tumors by some investigators during the last few years, reports in the literature are usually made on the basis of the following classification:

1. Papilloma.
2. Papillary Carcinoma.
3. Infiltrating Tumors.
4. Benign Tumors.

Sarcomata which may represent something less than one per cent of malignant bladder neoplasms are included with the infiltrating tumors. For the purpose of treatment and analysing results, this classification is fairly satisfactory.

Papillomata have usually been classed as benign growth in spite of their tendency to recurrence and reimplantation and subsequent growth in other parts of the bladder. Many papillomata will show a regular cell growth in most parts and yet in another part reveal an atypical epithelial cell type and arrangement which must be regarded as an evidence of malignancy. Caylor (2) using Broder's classification, believes papillomata correspond to grade 1 of malignant epitheliomata in other parts of the body.

Since the first use of fulguration in treating these tumors in 1910 (3), the method has been improved upon until most agree that 95% can be destroyed by use of the bipolar coagulating high frequency current through the cystoscope. The number of such treatments necessary will depend on the size, number and resistance of the growths. If the tumor does not yield to this therapy, exposure to radium applied through a cystoscopic applicator will often produce a change so that the growth will quickly disappear when electrocoagulation is resumed (4). The dose varies from small to massive amounts of radiation. One hundred milligrams applied for one hour, and repeated weekly until four or five hundred millieure hours have been given, has been satisfactory. Some who use this quantity of radiation do not screen out all of the caustic beta rays because of the belief that the tumors respond more readily. Those who use larger amounts of radiation try to screen out the beta rays and rely on the gamma rays alone.

After destroying a tumor by these methods, cystoscopic examination must be repeated every few months in order that recurrence may be detected and treated early.

When one considers papillary carcinoma and infiltrating neoplasms, one finds considerable disagreement as to the best methods of attack. Radical surgery, electrocoagulation, radium element, radium emanation seeds, actual cautery, and various combinations of these, all have protagonists. In considering the merits of these various methods we will confine ourselves to results reported relatively recently.

Some cases of papillary carcinomata can be cured by radium applied through the cystoscope followed by electro-coagulation. Young believes that 62% may be cured in this manner. Wherever there seems to be a reasonable degree of expectancy of success, these endovesical methods should be used first; because, when successful, the operative morbidity and mortality are decidedly better. If this fails or if there is a recurrence after apparent cure, or if such treatment seems unlikely to achieve the desired result because of the extensive nature of the disease, the

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bladder should be opened suprapubically and an attack made under direct vision. At such time we may find that what appeared through the cystoscope to be a small papillary carcinoma, is only the apex or visible part of an extensive infiltrating neoplasm.

With the bladder open, some surgeons will resect the tumor where this can be done completely with a good margin of healthy bladder wall. Success in this is more likely in tumors of the anterior wall, the vertex, or the lateral walls. Unfortunately, most tumors involve the base, the trigone, the area around the ureteral orifices or the urethral orifice. If only one ureteral orifice is involved, resection may still be carried out, the proximal part of the ureter either being reimplanted into the bladder wall or else permanently ligated and abandoned in the operative field. In the absence of infection, Judd (5) believes that only occasionally will a nephrectomy be necessary where the ureter has been ligated, the kidney simply degenerating. Others fear the immediate danger of kidney insufficiency and prefer to run the risk of the reimplanted ureter subsequently giving trouble. Dannheisser reported end-results of reimplantation of the ureter into the urinary bladder in eleven cases. Two died shortly after operation and in two others a nephrectomy had to be performed later. Of the remaining seven, six were examined from one and a half to ten years after operation. Five had a well-formed new ureteral opening with good function of the kidney to which the ureter belonged. In three cases a hydronephrosis had developed but function was good.

G. G. Smith (6) had 27% of two year cures after resection. Young and Scott, in reviewing 386 cases, state that resection of the tumor with removal of a wide margin of bladder wall gives good results. They had 27% of five year cures in fifty-one cases in which the wall of the bladder was resected.

Kretschmer (7) used electrocoagulation alone in one hundred and nine consecutive unselected cases of bladder neoplasms with 23 apparent four and a half year cures. This represents 21%.

Smith used electrocoagulation alone on 15 selected cases, with 27% of two year cures.

Young (8) reported 35 cases where deep actual cautery was the only method used. Nine or 25.5% were apparently well.

Barringer (9) reported 98 cases diagnosed on pathological observations, in which radium was used in the form of one 2 millicurie gold radium emanation seed to each square centimeter of tumor. Forty-three per cent of papillary carcinomata were controlled over three years by this method, while 29.7% of infiltrating carcinomata were controlled

over three years. These results are excellent. However, in analysing them, comment should be made on two points: first, in his technique, he removes the papillary or protruding part of the tumor with some form of cautery, and secondly, he includes among the papillary carcinomata, those papillomata which showed some atypical cells. We have shown that actual cautery alone will cure some cases of papillary and infiltrating carcinomata, and would probably cure as many cases of papillomata with atypical cells as electrocoagulation will cure, though some (10) think that part of the benefit of treatment with electric current comes from the change in potential engendered in the tissue. Nevertheless these results are good, because many of the cases were far advanced; but they cannot be attributed to radium alone.

Smith (6) reported 24 cases treated with radium emanation seeds, 29% being free from growth two years after. While these 24 cases were probably the least favorable of 50, we must attribute some unknown part of the good results to the fact that in nine of the twenty-four the growth was destroyed by extensive electrocoagulation before seeds were implanted into the base.

From the foregoing one sees that it is hard to obtain statistics on radium alone because it is usually combined with some other form of treatment (11).

It is also difficult to express statistically the benefits derived from deep Roentgen-ray therapy, though competent authorities believe that there is a distinct palliative effect, and that cure may be obtained in an occasional case. (12), (13).

Burnam and Neill (14) using very large doses of radium—as much as a gram for 1½ hour in the bladder—and external deep roentgen-ray therapy, cured 9.9% of large malignancies and 35% of the small ones. One cannot be sure from the wording of the report that electrocoagulation was not used in some of these cases as an adjunct.

Recently progress has been made in relieving pain in inoperable cases. Section of the presacral nerve in some cases, and in others, combined with division of the branches to the bladder of the hypogastric plexus, will relieve pain. (15)

Total cystectomy with implantation of the ureters into the sigmoid is still a very dangerous operation in malignancy, and should be applied only to those cases in which the surgeon feels that he cannot control the growth satisfactorily by other methods. The number of suitable cases is limited by the extent of the growth, because there is no use in removing the bladder unless you feel that there is a good chance of removing the entire tumor. This criterion, you see, limits the



cases for total cystectomy to a very narrow field (16). Biopsy is of some help here, as Caylor has shown that all tumors in Broders' Class IV of malignancy rapidly extend outside the wall of the bladder and metastasize early, and that Type III tumors extend fairly rapidly, while Types I and II tend to remain well located and, therefore, could be removed entirely by cystectomy (17, 18).

To Summarize: The treatment of papillomata and papillomata with atypical cells by electrocoagulation through the cystoscope, gives splendid results though radium is sometimes useful as an adjunct. By the judicious use of all of our therapeutic armamentarium we should cure approximately 25% of the remaining malignant bladder neoplasms. Usually the bladder should be opened, the tumor destroyed by electrocoagulation and gold radium emanation seeds of one and a half to two millicuries each implanted in the tumor base in the ratio of one seed for each cubic centimeter. These seeds are abandoned in the tissues where they do no harm; they become inert in about ten days, yielding one hundred thirty-three millicurie hours per millicurie. The trend at present is away from the use of gold seeds in favor of more heavily screened platinum needles containing the radium element. With the latter the dosage is more accurate and there is less necrosis (17).

The implantation of radium seeds through the cystoscope is useful in cases of recurrence in which there are small, bushy tumors of the papillary type which are resistant to electrocoagulation.

Where resection can be carried out with reasonable expectancy of success, this should be done because the tumor is removed entirely.

Where we cannot cure, our efforts should be palliative and we should avoid those measures which cause the patient to suffer several deaths instead of one.

Benign tumors are rare. When diagnosed they should be managed conservatively.

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#### NEUROLOGICAL SURGERY OF BLADDER NEOPLASMS\*

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In the consideration of any pathological condition three things are of usual paramount interest: diagnosis, treatment and prognosis. In a consideration of bladder neoplasms the first of these is relatively easy due to modern diagnostic methods; the type of new growth present is readily determined by inspection and biopsy. This differentiation is more simplified by considering all growths of the bladder as malignancies, determining by microscopic examination only the degree of such changes.

The second of these is somewhat more difficult varying from removal of the simplest pedunculated papillomas by means of the fulgurating current to subtotal cystectomy or total cystectomy with transplantation of the ureters to the external surface of the body or into the large bowel as in those cases in which malignancy is well established and infiltration is extensive. Other methods consist in the use of deep x-ray or radium emanations applied in a number of different ways.

The last of these, prognosis, is always uncertain. In the most benign tumors, local recurrence is the rule, slow at first then more rapid and in increasing numbers, and with a marked tendency toward greater malignant changes. In certain cases the growths are sessile and infiltration of the bladder wall evident when first brought under observation. Most of these, however, are relatively slow growing, only occasionally metastasizing early, but usually producing severe symptoms through secondary changes in the bladder mucosa, thickening and loss of elasticity of the bladder wall by their infiltrating character, by interference in urination by involvement of the sphincter, or by hemorrhage.

In the presence of bladder tumors, infection is usually quite evident, producing on its part a congestion of the mucosa with thickening, ulceration and irritability. This in itself leads to frequency, urgency and burning pains upon urination, which symp-

\*Read before the Jefferson County Medical Society.

toms may become so severe as to cause the patient constant torment and to prohibit rest and relaxation. The severity of these symptoms and the time of their appearance depends somewhat on the location of the growth. If the tumors begin, as they frequently do, about the bladder outlet or, as in the infiltrating types, over the floor or trigonal area the symptoms are apt to be early and severe, much more so than when the tumors begin over the walls or dome of the bladder.

Unfortunately, in the large majority of bladder tumors there is the greatly prolonged late stage, after all attempts at radical removal, either by surgery, by x-rays or radium, or by both have failed, in which the patient is reduced to the pitiable state of being still in fair physical condition but racked constantly by painful, burning urination and all too frequently by agonizing darting pains through the pelvis and lower extremities. In such cases three neurological surgical procedures are available as a final resort and as a means of contributing relief to the suffering individuals during their remaining days.

One of these, rhizotomy, is rarely used because it is always followed by incomplete loss of pain of the parts supplied and spasticity of the lower extremities and will not be further considered.

The second of these, cordotomy, has been used in a large variety of conditions ranging from luetic infections of the central nervous system to carcinoma of the prostate and bladder, and has always been for the relief of pain. The operation was first used by Spiller (1) in 1912 for relief of pain in the pelvis and lower extremities in a case of inoperable tumor of the cord, and has since been used by a number of surgeons including Leighton (2), Frazier (3), Peet (4) and Horrax (5); for varying conditions including carcinoma of the bladder and prostate.

The operation consists in the interruption by section of the anterio-lateral (Gowers) tract of the cord and may be done either unilaterally or bilaterally at a level sufficiently high to allow for variation in the crossing of the fibers from below upward. The tract is a crossed one and section is best made in the thoracic region, usually between the fourth and sixth segments. It should include all the fibers of Gower's tract and exclude all others, and when properly done should be followed by loss of pain and temperature sense on the contralateral side, but deep muscle sense and muscular control remains.

More recently Grant (6) of Philadelphia has reported the use of this procedure in thirteen cases involving the urinary tract, two for carcinoma of the bladder and two for

carcinoma of the prostate. Of those suffering with carcinoma of the bladder one was completely relieved of pain for a period of six weeks after operation, at which time death occurred; the other, who had been receiving one half grain of codein every three hours was relieved of pain for five months, two months of which he was able to work at his former occupation. Of the cases of carcinoma of the prostate, one died five days after operation of broncho-pneumonia, the other remained free of pain until his death four months after operation. In none of these was the operation followed by motor weakness.

In this type of operation, loss of sphincter control may seem to have a high incidence, but it must be remembered that in many cases involvement of the muscles by the growth has taken place and mechanical interference is present before the operation is undertaken. This is particularly true of carcinoma of the prostate and of the bladder when the growth involves the floor. Judgment of the operation should be based upon reasons for the attempt i. e. the relief of pain, and if this relief is attained should be considered justifiable.

In opposition to cordotomy, the third procedure is the section of the nerves of the bladder peripherally. These nerves are carried chiefly by the presacral nerve (mostly sympathetic) and by the hypogastric ganglion (mostly parasympathetic) and interference of supply by section of either of these leads to marked changes in bladder physiology. These procedures are difficult and almost always necessitate opening of the peritoneum, thus adding markedly to the severity of post-operative progress. They should only be resorted to in extreme cases.

As early as 1921 Rochet, quoted by Learmonth (7) published a paper on the treatment of painful cystitis. He stated that pain referred to the lower part of the urinary tract may be produced in three ways: By colic in the vesical part of the ureter; by painful contractions of the bladder wall; and by lesions of the vesico-urethral apparatus. In renal tuberculosis Rochet thought that pain originated in the lower segment of the ureter and in such cases performed a peri-ureteral sympathectomy on the lower five to six cms. of the ureter. In this series of operations he was successful. Furthermore, in two cases of tuberculosis of the bladder in which painful spasms, frequency and dysuria were prominent, Rochet performed neurectomy by attacking the hypogastric ganglion extraperitoneally. In these also he was successful in eliminating the pain, but loss of bladder control followed which with the presence of an intact sphincter, necessitated



routine catheterization of the bladder until death of the patients four months and one month respectively after operation. In one of these cases after a period of a month semi-control was re-established. In two later cases with slight modification of technique and division only of the larger roots of the ganglion, urination was readily re-established, it being necessary to catheterize one patient for only ten days.

Learmonth at the Mayo Clinic recently carried out the operation of Rochet on three patients, two of whom were suffering from carcinoma of the bladder. In the first case, one of carcinoma of the bladder, the larger efferent branches of the hypogastric ganglion were divided and also the presacral nerve, because of the fact that during the operation it was established accidentally that irritation of this nerve by traction caused severe bladder pain. The bladder was drained by catheter but all pain had disappeared, and remained absent until death of the patient from broncho-pneumonia eight days after operation. In the second case, one of tuberculosis of the bladder, the branches of one hypogastric ganglion and the presacral nerve were divided. The bladder was drained by catheter and could be distended without pain. A secondary operation became necessary on this patient because of rupture of the wound and he died of broncho-pneumonia eight days after the second operation. Pain, however, disappeared completely after neurectomy. In the third case, also carcinoma of the bladder, division of the presacral nerve only was done because involvement of tumor growth made exposure of the ganglia impossible. Pain was greatly relieved so that the patient could sleep throughout the night, and micturition was re-established after eight days.

Cordotomy occasionally fails to relieve pain because of the fact that the entire tract of Gower is not included in the section. It is followed by loss of temperature sense and pain below the level of supply at the point of section, and at times by loss of sphincter control. It is, however, an easier technical procedure and followed by a lower operative risk. Neurectomy, on the other hand, involves only the bladder, prostate and urethra. It is always followed by inability to empty the bladder, especially if all the efferent branches of the hypogastric ganglion are severed, but a lesser extent if only the presacral nerve is cut. But neurectomy is a somewhat more hazardous operation and carries a higher operative mortality.

It would seem then that the operations of cordotomy and neurectomy for the relief of intractable bladder pain due to carcinoma or other causes are reasonable and practical, though difficult procedures. They should only

be advised when all other means of relief have failed, and should be attempted only by one well acquainted with the methods of neuro-surgery.

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#### DISCUSSION

**Owsley Grant:** The problem of bladder tumor is really divided into two parts; first, so far as the diagnosis goes as to the extent of the infiltration of the tumor into the bladder wall with its possibilities of further encroachment and of its resort to metastatic consequences. It has been a mooted point for a long time, the definite classification of bladder tumor as to malignant or benign. It has been clearly shown that there occurs in some instances a definite transition of tumors which are originally classified as benign into a state where they are definitely malignant. With such a picture in mind it seems idle to speculate upon the particular characteristics of the tumor which presents itself. All must be classified as potentially malignant. I am opposed to the practice of removing specimens of the tumor through the cystoscope for biopsy if a definite plan of treatment is to follow, depending upon the diagnosis of such specimens. I do not believe that any negative finding of this type is sufficient to justify an inactive course because it is quite certain that one portion of a tumor may be benign and another portion malignant.

Second, the treatment of bladder tumors, considering that all are potentially malignant, must proceed along one principle—as complete eradication as possible. The possibility of complete eradication is dependent, first of all, upon the depth in the bladder wall to which the tumor extends; second, upon its location; and third, upon its size and multiplicity. In certain portions of the bladder wall, especially the dome and the lateral, the bladder can be freed from its surrounding tissues and resection is readily accomplished. This is the choice in all tumors located at these points in the absence of such indications as extreme age and metastasis. Resection, however, is not to be undertaken too lightly as there are many slight points in the technic that make the overwhelming difference between successful and unsuccessful excision. In the less freely movable portions of the bladder, that is, the base, trigone and the

sphincteric margin, the tumor is not ordinarily amenable to resection and its destruction must be accomplished either by radium or diathermy. In the small tumors that show no evidence of deep infiltration of the bladder wall, a great number may be successfully eradicated through the cystoscope. The larger tumors require open operation and the application of diathermy according to some controlled method. If radium is used, it may be used after any destructible part is removed by the cautery or diathermy. Radium is most effectively used in the form of permanent seeds of radium emanation. As to the use of radium, it may be said that in the large tumors the implantation of seeds in definite relationship, where they will accomplish their purpose without destruction of normal bladder mucosa and deep structures, is an extremely difficult matter. Radium implantation into the bladder in a great many cases causes an extreme and lasting cystitis which is even less bearable than the disease itself. Our most successful results have been obtained through the use of diathermy though some remarkable results are reported by Barringer with the emanations.

Each individual case of bladder tumor is a problem always new and demanding the nicest judgment as to best treatment. This judgment is founded on, first of all, experience with the cystoscope and the interpretation that this picture is given by the operator and, second, on the findings at open operation as to the extent to which the pedicle has penetrated into the submucous tissues of the bladder.

**B. F. Zimmerman:** The papers of this symposium have been very interesting, and the subjects it seem to me have been as thoroughly covered as the time allotted would permit. What few remarks I have to make will be limited principally to the subject of Dr. Bowen's paper.

The intolerable pain of the later stages of the malignant bladder, has been mentioned by all the essayists, and it is toward the alleviation of this condition that neuro-surgery has made some contribution. Of the two principal neuro-surgical procedures, cordotomy is in my opinion the one of choice. We must, of course, assume certain risks in undertaking the operation because: First, many of these patients are in a very bad physical state, and in such cases the mortality may be fairly high. Second, all of the pain fibres may not be severed and hence complete relief will not be obtained. Third, the lateral pyramidal tracts may be injured, leaving a partial paralysis below the site of operation.

In my opinion, the immediate post-operative danger is not greater in cordotomy than the extensive resection of the pelvic and hypogastric nerve supply; and judging from the reports that I have perused, there is as great danger of failure to get all the pain fibres in the peripheral operation as there is in cordotomy. Fol-

lowing cordotomy, we may hope to have an automatic bladder; whereas in the operation for removal of plexuses it is sure to leave an incontinent bladder if the operation is radical enough to give complete relief from pain.

**J. R. Wathen:** I would like to speak on one phase of the subject, namely, Cancer of the Bladder. If we hope in our campaign for the cure of cancer to make any progress it will have to be by an appreciation of the latest and more radical means of combating this disease. I have little faith in radium and x-ray in cancer of the bladder and feel that electro-coagulation or fulguration offer little more.

We usually receive these cases fairly well advanced after the urologist has failed with them. Judd says cancer of the bladder is epithelioma in 95% of the cases; 50% of which belong to class one and two and involve only the mucous membrane of the bladder, while the other 50% are in class three and four and involve the entire bladder wall. Our method for handling these cases is to first transplant the right ureter into the sigmoid, and in about ten days if the patient is doing nicely, at a second operation, transplant the left ureter and at this same operation remove the bladder—in the female with comparative ease; but in the male I would suggest to wait a few weeks for the entire removal of the bladder at a separate operation as it is more difficult on account of the prostate, but if the prostate is not involved it can be left.

If we hope to make any progress in the surgical treatment of Cancer of the Bladder we will have to be more radical than in the past; and we must take a lesson from our experience of breast tumors in which we appreciate the advantages of the radical removal. I take no stock in cutting the nerves which supply the bladder, as one of the essayists suggests, as this is only palliative and in no way cures the cancer.

**J. Garland Sherrill:** Transportation of the ureter is a nice piece of surgery. Coffee has done a great amount of work in this line, and has shown that operation can be performed successfully by a competent surgeon. It should be completed and proper function obtained in the implanted ureters before the resection of the bladder for cancer is attempted. A cancer of the fundus may be excised and sutured without interference with ureteral function. Tumors of the base cannot be treated in this way, and are best treated by the electric coagulation method.

**Frank P. Strickler:** I would like to speak briefly on this subject. Dr. Coffee's latest technique is not as difficult as we would expect it to be from Dr. Sherrill's discussion. In Dr. Coffee's latest technique, he does not open the intestinal lumen at all but implants the ureter under the muscular coats of the intestine and passes a linen suture through the mucosa and



the lumen of the intestine and ties this suture tightly over the ureter. This suture eventually sloughs through in about twenty-four hours and establishes an opening into the intestinal tract. The Coffee operation is not a difficult one at all.

From the makers of cystoscopic catheters, one would think that the ureter is very small, about the size of a broom straw and that it would be a very difficult anatomical suture to find. But this has not been my experience at all. The ureter is rather easily found and is at least, the size of a lead pencil and in many instances even larger than this.

After all, the thing that causes the pain in neoplasms of the bladder and makes these conditions more difficult to treat, is the presence of urine in the bladder. When the flow of urine has been diverted into the intestinal tract, as is accomplished by the Coffee operation, we immediately make the patient more comfortable and stop the pain. We then are in a position to excise the bladder surgically or pack it with radium. I have seen some cases of Dr. Coffee where the bladder had been packed with radium and as a result, the scar tissue of this treatment reduced the bladder to the size of a small lemon. I see no advantage whatever, in doing cordotomies or the section of various nerves to control pain in the bladder, as when we do these operations or advise them, we are merely temporizing with the true condition and in no way stop the growth of the neoplasms or benefit the patients condition. I do not think that we will ever lower the mortality of malignancy in the bladder unless we deal with this condition from a very radical standpoint.

**G. A. Hendon:** I would not attempt to classify the indications for transplantation of the ureter in neoplasms of the bladder, however, it is a procedure that has its purposes and recommendations. My object is to present the technique which I have found to be very satisfactory in five cases. Four of these were cancer. The fifth was an exstrophy. The technique briefly described is as follows: The ureter is exposed and divided at its entrance into the bladder. The distal segment being ligated with a silk suture. A catheter, varying in size according to the lumen of the ureter, is passed into the pelvis of the kidney. It is quite remarkable that some ureters will accommodate as high as 22 French catheters. The smallest I have ever used was a 14. It is secured by two or three chronic catgut sutures, transfixing both catheter and ureter at regular intervals. The distal end of the catheter is then carried through an opening in the bowel and anastomosis thus made between the ureter and the intestine. The advantage of this operation is its simplicity and the fact that the urine is delivered into the bowel at a considerable distance from the point of anastomosis,

thereby relieving the line of suture from the effects of contamination of urine. As soon as the catgut holding the catheter in the ureter becomes absorbed, the catheter is discharged into the bowel and is passed through the rectum, which takes about one week.

I submit this as a technique to be employed when it is desirable for any purpose to divert the flow of urine away from a diseased bladder or as relief of exstrophy of the bladder.

**D. Y. Keith:** There are only two points I would refer to in the management of tumors of the bladder.

First, is the value of an air-cystogram which in my judgment and experience should be done on every case. As a rule it is not painful to the patient and is done by placing a soft rubber catheter in the bladder and distending the bladder with air. Immediately after this procedure films are made in antero-posterior and posterior antero positions. Usually it is quite easy to tell the amount of infiltration in the bladder wall, which gives an irregular "fat eaten" shadow that is characteristic of malignancy of any hollow viscus. The information gained cannot be gained with the cystoscope and rarely ever is any more information gained by operation. Pedunculated tumors can be seen projecting into the air shadow and frequently tumors not larger than a sewing thimble can be detected.

The second point is in regard to treatment. Most of these patients will show some improvement in their general condition and usually have relief from pain if high voltage x-ray is properly given. Unquestionably, anyone who attempts to treat tumors of the bladder should have co-operation with the general surgeon, urologist and radiologist. Many of these cases can be improved and many more can be made comfortable by the use of surgery, cautery, radium or high voltage x-ray. Frequently it requires a combination of all of these to accomplish results.

It appears if the operation for transplantation of the ureter into the gut can be made a safe procedure and one that the average general surgeon or urologist can perform without mortality, greater improvement can be expected from the use of radium and x-ray following the above procedure. Radium could be applied into the bladder as vigorously as radium is applied to cancer of the cervix or cancer to the body of the uterus, then I am sure results in cancer of the bladder could be expected from irradiation.

I know of no one who is enthusiastic about the results obtained in treatment of carcinoma of the bladder. It appears to me the best results obtained at present is the combination of cautery, radium and x-ray. These results, we believe, can be improved, if the ureters can be successfully transplanted and larger and more highly filtered radiation applied.

**R. Glen Spurling:** This is a most interesting and instructive symposium. I should like to say a word regarding cordotomy as a pain relieving measure in malignant disease in and about the urinary bladder. I am not very enthusiastic about the operation for relief of pain of a malignant disease. In the first place, the patients are all very bad operative risks. In the second place, even though the pain may be relieved, the span of life is usually very short. If all other pain relieving measures have failed, however, and the patient is anxious to submit himself to operation, knowing the exact status of his case, then I believe it may be worth while.

The operation of cordotomy is by no means a simple one. The danger of pyramidal tract injury and the interference with the normal emptying mechanism of the urinary bladder are factors to be seriously considered. I do not mean to condemn the procedure because of these reasons; but I do feel that the condition for which it is done should offer a reasonable outlook for an active useful life. In certain cases of intractable pain from inflammatory conditions of the nerve roots, peripheral nerves, tabes dorsalis, etc., this operation offers the best results of any at our disposal, and in fact may be one of the most satisfactory procedures known to surgery.

**James R. Stites,** (in closing): Gentlemen I want to thank you for your kind discussions. I enjoyed them very much. I feel that I escaped most of the "fire," for the program committee was kind enough to assign me the subject of "Diagnosis."

In regard to the size of the ureter, I think this subject has been somewhat exaggerated tonight. It is true that after the ureter leaves the bladder it is much larger in size and more readily dilated, but any normal ureter would be under tension to have a catheter as large as a No. 22 French. The intramural portion of the ureter is very small, and the majority of Urologists are happy to be able to introduce a No. 6 ureteral catheter.

**John T. Bate,** (in closing): It has been aptly said that there are three kinds of liars: Liars, damn liars and statistics. Even though these hold partially true, we must have some way of reasoning about our conduct of these cases, so we must either reason on the basis of a clinical classification, a therapeutical classification, a pathological classification, or by using all three. In this paper we have followed the latter.

Radium, I believe, has a distinct value in the treatment of bladder tumors. Since the development of the use of radium—emanation seeds, physicians in cities such as Louisville can obtain just as much radium-emanation therapy as Dr. Barringer uses at the Memorial Hospital. Dr. Barringer uses the emanation seeds even

though he has several grams of the element at hand. Pfahler reported a series of twelve cases with four apparent cures from the use of radium and deep x-ray therapy alone.

I agree with the gentlemen, who spoke on the subject of radical surgery, that since achievement of improvement in our technique of transplantation of the ureters into the sigmoid followed by total cystectomy, this operation will be used more frequently in the future than it has in the past. In this type of case, we are dealing with elderly patients who have extensive malignancies, with lowered resistance to infection and lessened power of tissue repair; so, we must not expect results comparable with those obtained from transplantation of the ureters into the sigmoid in exstrophy of the bladder.

I wish to thank the gentlemen for their kind discussion.

**J. A. Bowen,** (in closing): I want to thank the gentlemen for their kind remarks. However, I did not wish to say that the operation as described should be done except as a final and last resort. The patients are in pain, the outcome of their bladder condition is certain and relief of their pain by some such operation will prolong their lives to some extent and will surely make them more comfortable while they do live. For these reasons I feel that it is well worth while.

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**Raynaud's Disease.**—Allen and Brown state that Raynaud's requirements for diagnosis of the clinical syndrome which justifiably bears his name are valid and are borne out by their studies of more than 150 cases. These requirements are: (1) Gangrene or trophic changes limited in a large degree to the skin; (2) symmetrical or bilateral involvement; (3) absence of evidence of occlusive lesions of the peripheral arteries, and (4) intermittent attacks of changes in color which usually precede the trophic changes by months or years. Many of the cases reported by Raynaud were not illustrative of the condition described by him, as is usually the case with eponymic diseases described many years ago. They did not fulfil the minimal requirements. The use of these cases as models by many subsequent authors has led to a high percentage of erroneous diagnoses. Study of twenty-five cases reported in the literature as Raynaud's disease shows that none of them fulfils the necessary requirements for such a disease. These cases are characterized by failure to adhere to Raynaud's basic requirements, and inadequacy of examination of patients. Many of the cases are obviously examples of thrombo-angitis obliterans. The authors emphasize the fact that accurate diagnosis in peripheral vascular disease is essential if treatment is to be properly evaluated.



## AEROPHAGIA OR GASTRIC PNEUMATOSIS\*

A. A. SHAPERO, M. D.

Louisville.

The swallowing of small amounts of air during a meal is a physiological process. A considerable amount of air enters the stomach in children, especially in infants or adults who eat or drink rapidly. Air contains approximately eighty per cent of nitrogen, an inert gas which cannot be absorbed by the gastro-intestinal. The swallowed air is eliminated by means of eructation and the passing of flatus.

The presence of air in the stomach is well demonstrated by the x-ray in the form of an oval air vesicle. The size of this air vesicle depends on the individual, corresponding to his habit of swallowing a greater or lesser amount of air. The air may remain in the stomach for a considerable length of time, but it is frequently seen to disappear suddenly by means of belching.

Aerophagia or gastric pneumatosis is a condition in which the air vesicle in the stomach is markedly enlarged, resulting from swallowing large amounts of air, and is independent of taking water or food.

Air swallowing is seen occasionally by every physician and is frequently the reason for which he is called to see an excited patient. The adult patient often has a pronounced vertigo, marked pressure and tension in the cardiac region, slowing of respiration and a sensation of fullness exists in the stomach. These symptoms cause the patient to believe he is going to die.

On physical examination, the heart is difficult to outline due to the presence of the large air vesicle in the stomach and the elevation of the diaphragm on both sides, more pronounced on the left. The pulse is full, slow and regular. A splashing sound is heard when the patient is shaken. The lower abdomen is often distended though usually this is restricted to the epigastrium and left hypochondrium. The larynx is seen to move up and down in swallowing movements, the patient often being unaware of this and at times stating that he must swallow saliva.

Roentgen examination shows a large accumulation of gas in the stomach on the left side of the abdomen which elevates the diaphragm as high as on the right side, displacing the heart to the right and at times even into the right thorax. The excursion of the left diaphragm is as great as the right.

The patients predominantly females belong

to the intellectual group, those having an increased irritability. They complain of the stomach, heart, sometimes dyspnoea. Often they suffer with vertigo with or without anxiety. Those complaining with gastric disturbances have a feeling of fullness after meals, rarely gastric pain.

There are cases of aerophagy, the latter being a symptom of a severe organic condition as esophageal carcinoma. It is also seen in gall bladder and stomach disease, to a slight to moderate degree in heart disease, most frequently in sclerosis of the coronary arteries, rarely in lung and pleural affections. About 60% of patients having organic or functional disease of the gastro-intestinal tract are belchers or have symptoms referable to aerophagy.

The air is trapped in the stomach by a cardiospasm and at times a pylorospasm. Occasionally the pyloric sphincter is relaxed allowing the air or gas to enter the intestines producing meteorism. In these type cases the chronic gas bubble may or may not be present, its absence due to passage of air into the intestines through a relaxed pylorus.

The diagnosis is made fluoroscopically on observing the air pass from the stomach into the intestine. The presence of gas simultaneously in the stomach, small and large intestines, with the above mentioned symptoms makes the diagnosis of aerophagia highly probable.

As most adult cases of aerophagia give a history of the disturbance commencing during childhood, the following case is presented:

Case of M., female, Jewish, age 3½ years, complaining of marked weakness, inability to walk, abdominal distension, marked anorexia belching, passage of large amounts of odorless flatus, and having 10 to 20 small mucoid stools a day.

Past History. Patient was a full term, para 2, normal delivery weighing six pounds at birth, November 16, 1926. There was no vomiting nor colic during infancy and was breast fed until 8 months. Orange juice was given at 3 months, cereals were added at 6 and vegetables at 8 months. She refused cod liver oil during infancy, but received Viosterol when 3 years of age. Had Chicken Pox at 2½ years, no scarlet fever nor diphtheria. Vaccinated at 6 months. Toxin-antitoxin at 5 years.

She was always, or some, overweight, well developed and was considered a bright as well as an excitable child.

The patient first complained of weakness, inability to walk, anorexia, belching and the passage of large amounts of odorless flatus in April, 1930, at the age of three and a half

\*Read before the Jefferson County Medical Society, April 18, 1932.

years. She was treated by her family physician for intestinal indigestion for several months. He recommended consultation and later referred her to another physician for treatment. This attack lasted six months. She belched intermittently and passed odorless gas continually. She had 10 to 20 small mucoid stools a day, continually soiling herself. She is a highly excitable child and her mother stated that the least excitement, such as a party or being taken to a movie, aggravated her condition tremendously.

Towards the end of this attack, in August, 1930, she was taken to a physician in Memphis where a diagnosis of chronic intestinal indigestion and chronic tonsillitis was made. Her tonsils were removed under general anesthetic and her symptoms stopped immediately as if by magic. I attribute this to the anesthetic and painful throat which prevented her from swallowing. She was free from any symptoms for two months and her parents felt she was cured. They suddenly returned at this time when I first saw her. The symptoms were identical to those during her previous attack. The patient was four years of age and was most difficult to manage. A physical was done on throat and abdomen only.

Her throat showed a clean tonsillectomy, no catarrh nor post nasal drip was present. The abdomen was markedly ballooned, and tympanitic. There were no masses, no fluid nor tenderness present. Temperature 99°F.; pulse 96, Resp. 28. Rectal examination showed relaxed sphincters; the sigmoid was considerably larger than normal; no feces present. A large amount of flatus passed during the examination. Phenobarbital was given and the attack subsided in a few days. Arrangement was made for a gastro-intestinal series and barium enema but the parents refused this procedure, fearing her condition might become aggravated.

Two months later she was seen again by the physician in Memphis and a diagnosis of pyelitis was made. On returning to Louisville she was taken to a genito urinary man for study at which time a flat plate of the abdomen and a barium enema under the fluoroscope were done.

The x-ray report of Dr. Enfield was as follows: A preliminary film of the entire abdomen shows as the only unusual feature an enormous amount of air in the stomach, the shadow of which occupies about two-thirds of the abdominal cavity. There are no abnormal densities although the gas shadow is sufficient to mask any small and not very dense shadow which might lie in the urinary tract.

A barium enema was administered under

fluoroscopic observation. The colon filled normally to a perfectly normal outline. There are no filling defects. There is no obstruction. There was no unusual amount of gas in the colon. The patient was not unusually intolerant of the enema considering her age.

#### CONCLUSION

From the history, I judge that this small patient is in the habit of gulping large amounts of air which in itself may account for the presence of an unusual amount of abdominal gas. It is true, however, that pyloric obstruction in infants causes much the same appearance.

I saw this patient again on October 2, 1931, with the same disturbance. She was most unmanageable and the physical was the same as formerly. I placed her on a fat free diet and had her removed to an aunt's home believing that a change of environment might benefit her, as she had a younger brother at home who excited her while playing or resting. She soon became dissatisfied and returned home after three days. She was then separated from her brother and was made to take a daily nap in the afternoon for two to three hours. Sedatives consisting of Bromides, Luminal and Belladonna were given and this attack subsided in two weeks. The sedatives were continued for a month subsequently, the dosage being gradually reduced. At present she is free of any disturbances, sleeps three hours every afternoon, has an excellent appetite, and has one normal bowel movement daily. She has gained weight and is in good health at present.

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**Mechanism of Ultraviolet Irradiation in Rheumatic Diseases.**—Llewellyn and Jones stress the fact that "rheumatism" is primarily the outcome of an inborn tendency to "instability" of the heat or temperature regulating mechanism. The storage in the skin of the amino-acids tyrosine and cystine is of fundamental and probably etiologic significance. Tyrosine is the mother substance of which the temperature-regulating hormones thyroxine and epinephrine are chemical derivatives and also of melanin through the action of the ferment tyrosinase. Tyrosine enters into the formation of insulin, another heat-producing hormone, and the sulphur content of insulin is derived from cystine. The amino-acids tyrosine and cystine exist in free state in the blood and have been detected in the sweat. The blood content of tyrosine and hence potentially of thyroxine and epinephrine is increased by ultraviolet irradiation.



## HYPERTHYROIDISM\*

H. C. OSBORN, M. D.

Asland.

I have selected for the subject of this paper "hyperthyroidism," which is a condition that should be of special interest not only to the general practitioner, but to most of the specialties as well.

The doctor who does general surgery may conscientiously side-step thyroidectomies as belonging to a special field of surgery only to be confronted at any time with the alarming reaction that is sometimes encountered following other operations not related to the thyroid; in which the patient for no apparent reason, following a simple operation, suddenly is discovered to be in a state of profound collapse taxing the resources of the surgeon to overcome. The surgeon may have taken a careful history without obtaining any information to cause suspicion of a hyperactive thyroid in advance.

Again, it has many times happened that in the presence of typical local symptoms of acute appendicitis, the surgeon has confidently cut down over McBurney's point to find a normal appendix when in reality the condition was due to the crisis of toxic goitre, including some temperature and active vomiting.

So whether the surgeon selects this class of patients or not, he will occasionally be confronted in one way or another by the problem of treating temporarily at least patients with this condition.

The eye, ear, nose and throat man will occasionally be consulted for eye symptoms, not only exophthalmos, but failure of convergence, diplopia, asthenopia, and sometimes even ulcers of the cornea resulting from goitre. Laryngitis, aphonia, hoarseness, dyspnea, resulting from this condition also engage the attention of the laryngologist.

The skin specialist is often first consulted on account of pigmentation of the skin, eczema, vitiligo, pruritis, excessive moisture of skin, and erythematous blushings.

The nerve man is of course first in a great number of cases on account of the extreme and uncontrollable nervousness that invariably accompanies this condition.

The X-ray man, next to the surgeon, is probably most often consulted, both in the treatment and the diagnosis, especially the diagnosis of its complications.

Even the genito-urinary man is sometimes first consulted on account of excessive urinary secretions which often contain traces of sugar and in the presence of the voracious appetite

and with loss of weight, may be confounded with diabetes.

These different angles of approach to this disease are mentioned to remind you of the universal contact this disease makes with all branches of medicine and the interest which should be generally manifested in this condition.

Hyperthyroidism is a constitutional intoxication due to excessive and perverted thyroid secretion. Hyperthyroidism is also known as toxic thyroid, thyrotoxicosis, Graves disease, Basedow's disease, Parry's disease, toxic goitre, exophthalmic goitre.

There are two types of toxic thyroid, one in which there is a smooth symmetrical enlargement of the gland with no nodular masses. This type is accompanied by a perverted as well as an excessive secretion. In the other type the gland presents one or more hard nodules and the secretion, while normal in character, is excessive. This latter type is known as adenoma of the thyroid and is the more favorable as to prognosis.

Hyperthyroidism is much more common in women, some authors giving the relative proportion as high as eight to one. It is predominantly a disease of early adult life, 60% of the patients being under forty years of age.

Thyroid patients are extremely nervous and apprehensive. They can not sit still, cannot relax, and are in a vicious circle fashion, further disturbed by being well aware of their nervous instability over which they have no control. Efforts of the will to suppress the nervousness greatly exaggerate the condition.

There is a fine tremor of the fingers easily observed while the arm and hand is extended with the fingers separated.

The gland may be considerably enlarged, but in most cases it is only slightly enlarged, in some cases being so slight that it cannot be detected. The enlargement is usually symmetrical, but in some cases it presents one or more nodules as in adenomata of the thyroid. The blood supply of the gland is greatly increased, the vessels, especially the superior and inferior thyroid arteries, being greatly increased in size, with a thrill that can be easily felt and an audible bruit that can be plainly heard when stethoscope is placed over the gland.

There is an increase in systolic blood pressure with a decrease in diastolic, in other words, an increase in pulse pressure. This is easily understood when we observe the enlarged rapidly beating heart, coupled with dilation of peripheral capillaries.

Palpitation and tachycardia are invariably complained of at the outset, only on exertion later, even while resting. Peripheral pulsa-

\*Read before the Greenup County Medical Society.

tions, especially in the carotids, are easily observed. Palpitation and irritability of the heart is followed by dilatation, and finally by decompensation, if the condition is not arrested. Not only the heart but the aorta, especially at the arch, is much dilated, as can be brought out by fluoroscopic examination. The heart can be felt and its pulsations seen to the left of the mammary line over a large area. A systolic aortic murmur is often heard. This is believed to be caused by the rush of blood into the dilated aortic pouch.

Shortness of breath and dyspnea on exertion are complained of, greatly increased by exercise, especially walking up a hill or stairway.

Muscular strength for temporary exertion is not much impaired, but sustained effort is greatly reduced. The quadriceps extensor group is especially impaired, the patient complaining of weakness in knees, especially on going up or down stairs.

The internal recti muscles also show degenerative changes resulting in failure of convergence when accommodating for near objects.

The eye symptoms in hyperthyroidism may or may not be present.

Exophthalmos are not found in toxic adenomata, but are many times found in toxemias resulting from hyperplasia of thyroid, although Crile says that in his clinic exophthalmos are not often found. It is practically never found as an early symptom, but develops later. The protrusion may be slight as is usually the case, or so marked that the bulbs slip beyond the eye lids. In marked cases the cornea may ulcerate and even panophthalmitis result. Fortunately, these cases are rare. There does not seem to be any relationship between the severity of toxemia and degree of exophthalmos, which may remain even after the patient has apparently recovered. The exophthalmos may or may not be confined to one eye.

Von Graefe's sign is a disturbance of the associated movement between upper lid and eye ball so that when the patient is directed to look downward the lid does not follow the eye so that a white margin of sclera intervenes.

Moebius' sign is due to a weakness of convergence, due, it is claimed by some, to a degeneration of internal recti muscles.

Dalrymple's sign is the appearance of a slit between the lids when the patient is at rest. It is not due to exophthalmos but to a heightened tonus of levator palpebrae muscles. These eye symptoms may or may not be present.

The skin symptoms in toxic goitre are marked and almost invariably present. One

of the first to be noticed is pigmentation of the skin especially about the face, although absorption of the skin pigment or vitiligo is occasionally found. Moisture of the skin and excessive sweating, especially of palms and axillary spaces, are common symptoms. Eczematous patches are especially found in the folds of the body as in the groin and axillary spaces. Pruritis is often an early and aggravating symptom. Brittleness of nails and falling of the hair are also observed.

An erythematous blush, especially over the upper part of chest and face, is often seen. The play of the vasomotors may also be shown by drawing a line with point of pencil or other sharp object across the skin. A swollen reddish discoloration soon takes its place, the so-called dermatographia.

In well defined cases more or less well developed digestional disturbances are invariably present. The appetite is unusually good, the patient consuming two or three times what has previously been a normal amount of food, at the same time rapidly losing in weight. Vomiting, especially following exertion, and, frequently, attacks of diarrhoea, are complained of. Pain in the abdomen, more often situated in right inguinal region, is often intense. This, with the vomiting, digestional disturbances and occasional slight temperaure, has many times caused a diagnosis of appendicitis to be made.

The urine is always excessive, contains excessive phosphates, often traces of sugar and albumen, and occasionally hyaline and granular casts. This has caused in many instances a mistaken diagnosis of diabetes mellitus to be made.

While in well marked cases it is hardly necessary the metabolism test used to determine the amount of oxidation is of great importance as a final aid to diagnosis, especially in border-line cases. Crile states this test is not necessary in most cases, being used in his clinic only in the border-line cases.

The prognosis in these cases is usually good if a prompt early diagnosis is made and the proper treatment instituted. However, in neglected cases, after the heart is dilated and decompensation appears, the outlook is not so good. In neglected cases of long standing the nervous system is sometimes permanently damaged. Some cases have a tendency to spontaneous recovery, but this is usually not the case, and owing to the natural tendencies toward remissions and recrudescences of this disease, it is difficult to know just what the outlook is in any particular case. The return of weight to normal and the lack of nervous symptoms, if persistent, are good omens pointing to recovery.



The length of time for recovery after operative treatment varies usually requiring about the same length of time for recovery as the disease has been in developing.

Treatment is divided into medical, x-ray and surgical. Under medical treatment, rest, physical and mental, is most important. This is to be carried out over a long period of time, both in mild cases as a method of treatment and possibly cure, and in severe cases as a preliminary treatment preceding operation.

Of drugs, iodine is most efficacious and is usually given in the form of Lugol's solution, or sodium iodide. Bromides for nervousness and general tonics are also indicated.

There is some controversy as to the relative value of surgery and x-ray radiation in the hyperplastic type of toxic goitre. However, in toxic adenoma all are agreed, even the roentgenologist, that surgery alone offers the only hope of recovery. In the hyperplastic form as well as in the adenomatous type Crile says all cases should be operated, however mild, as soon as diagnosis is made and patient properly prepared. However, there are good men who advocate a series of x-ray radiations of moderate intensity as a curative treatment in mild cases, and as a preliminary to operation in severely toxic cases, and also following thyroidectomies where the patient, after considerable lapse of time, has toxic symptoms still left as a result of thyroid residuals.

To my mind, there is no doubt of the value of x-ray treatment, as I have had occasion to observe it in some cases of my own both following thyroidectomy and in a severely toxic case refusing surgery, with excellent results in both conditions.

It is my opinion that if the patient is properly prepared and skillfully operated by a surgeon giving special attention to this class of work, and whose experience, both in the point of technique and observation of operated cases over a long period of time, enables him to use the proper judgment, not only as to amount of gland to be removed, but as to the safety measures to be employed, both in the preparation of his patient and post-operative procedures, this procedure offers the best hope of permanent relief.

Crile, in his last series of approximately five hundred cases reported, including all types even to edema of extremities, had a mortality of less than 1%. He states that he operates all after they have had a thorough preliminary treatment of absolute rest and thorough Lugolization, even to the very worst types.

Considering such groups of symptoms as this disease presents, it would seem that the prompt and certain diagnosis after examina-

tion or even observation of patient would always be made. However, this is not the case, as it is as often overlooked as any other condition. The symptoms are often vague and the process is so insidious that the patient by a process of mental adjustment to the changing personality is unable to describe his symptoms or to tell the examiner definitely much about his condition.

In this connection, Crile has written a chapter on border-line cases in which he explains there are cases in which every degree of symptoms resulting from a slight increase of metabolism up to true exophthalmic goitre, are observed. It is in these cases of partial hyperthyroidism that the greatest skill and judgment are required in diagnosis. When we consider this condition from all angles it is convincing that we are dealing with a condition not of the diseased thyroid gland alone, but a condition involving probably the entire endocrine system whose ramifications extend to the most vital and least understood of the processes of the human mechanism.

#### DISCUSSION

**M. D. Garred, Ashland:** I wish to thank the members of the Greenup County Medical Society for their invitation to discuss this paper of Dr. Osborn, and I also want to thank Dr. Osborn for the good paper that he has prepared. It is certainly timely, and one that should bring out a good deal of thought from the general practitioner.

Especially do I wish to emphasize the complications and confusions that may arise from a toxic thyroid. Toxic goitre may assimilate almost any disease in the body.

I cannot urge too strongly the importance of early diagnosis and early operation of toxic goitres. We too frequently see permanent heart damage, and permanent injury to the nervous system especially, and the other systems, more or less, as a result of palliative treatment of thyroid diseases.

Iodine should only be used as a pre-operative drug and where its effects are spectacular and almost specific, and by the proper use will prevent the multiple stage operations that were done in the past. From the general practitioners standpoint, I wish to bring to your attention the fact that no goitre should ever be put on Lugol's or any other form of iodine, until that patient has submitted to operation and is ready to go to the hospital. They must be operated within three weeks from the time the Lugol's or iodine therapy is started. When a patient has once been gotten in shape by the administration of iodine, and allowed to go on without surgery, that patient will never again be gotten in as good a condition, and that is a very important fact to remember, especially as iodine therapy is too frequently described

as a palliative measure in this disease.

I will not go into the discussion of rest, digitalis, and sedative drugs that should be administered in the pre-operative preparation.

In regard to x-ray and other forms of radiation. Their greatest field is in getting the patient ready for operation, and not curative.

In regard to basal metabolic rates. The test has its greatest value in making the diagnosis. There is no use making repeated metabolic rates after the diagnosis is made and the patient is on Lugol's solution, because the patient will reach its maximum benefit within two to three weeks and must be operated at that period, regardless of the rate, as the patient will then be in the best condition they will ever be gotten in.

I have enjoyed the meeting very much, and enjoyed Dr. Osborn's paper and the discussion of his paper.

### THREE DIFFERENT KINDS OF TUMORS IN THE SAME PELVIS\*

J. GARLAND SHERRILL, A. M., M. D., F. A. C. S.  
Louisville.

Histologically, neoplasms of the ovary are divided into:

1. Benign Epithelial Tumors.
2. Malignant Epithelial Tumors.
3. Embryomata including dermoid cysts and teratomata.
4. Connective tissue tumors, as: fibromata and sarcomata.

These growths arise from the predominant structural division of the genital aulage.

1. The simple cysts of Morgagni arise from Wolffian remains, and so are frequently found as three, four, or more simple serous cysts of small size attached to the peritoneal fold near the oviduct.

2. The larger solitary serous cysts spring from the parovarium and grow out from the broad ligament, at times reaching large size, or develop between the layers as intraligamentous cysts.

3. Those cysts which develop from the paroophoron usually are multilocular with mucigenous contents varying much in color and consistency. These cysts are often hemorrhagic in type and many increase in size rapidly. They are usually not malignant.

4. Those cysts which grow from the oophoritic or egg-bearing tissue of the ovary vary considerably in structure and in their clinical course. They are made up of a basement membrane lined with a glandular epithelium, and appear to be a direct enlargement of the egg-bearing follicle which from disturbance of function has been stimu-

lated to over-growth. These tumors show a tendency to the production of papillomatous ingrowths and occasional outgrowths, are for the most part multilocular, and in many instances show transplants into the surrounding peritoneum of the broad ligaments, the uterus, the bladder, the intestine and the abdominal wall.

The contents consist of a thick mucigenous material varying in color from a yellowish brown to a deep chocolate. The contents of each saccule has a color and consistence of its own. Papillomatous masses are broken off and these fragments in part determine the consistency of the contents. Such cysts are essentially malignant when they show a marked papillomatous ingrowth, and if the peritoneum is soiled by their fluid content in removal, it is likely to show prompt papillary growth in its structure.

5. In addition to the simple form of neoplasms developing from the ovary the teratoma or dermoid is one which has excited much debate as to its origin. One view holds that it develops purely from a stimulation of all the cellular structures within the ovary. The exact stimulus to such development is unknown, but some hold that a missed fetation plays a part in determining the development of these growths. Cysts of oophoritic origin and teratomatous growths as well, must not be confused with Krukenberg tumors which are believed to arise from the intestinal canal. In this connection, it might be well to remember that the intestine and the genital tract are both of epithelial origin, hence the similarity in these neoplasms.

6. Connective tissue tumors occur as fibromata and sarcomata and spring from the connective tissue of the ovary. They are not frequent. The sarcomata make up about two per cent of all the malignant growths of the ovary. In Taylor's series (Howard C. Taylor, S. G. and O. 1929, Vol. XLVIII, No. P. 204-230) there are two in eighty-eight cases. Two cases of papillary cystadenosarcoma are recorded, one by Pfannenstiel and one by Cullen.

7. Carcinomata. Any one of the growths described above may become clinically malignant, and may show definite evidence in its histological structure of carcinoma. All through the literature of cellular pathology the origin of the cells which form the ovarian tumors has been a disputed point. Every type of cell found in the adult ovary, in that of the embryo, and in the neighboring embryological structure, as the Mullerian and Wolffian ducts, have been found in these growths and have been considered responsible for their development. A considerable percentage of carcinomatous cysts are sec-

\*Read before the Jefferson County Medical Society, April 4, 1932.



ondary in origin. Out of a group of ninety primary ovarian carcinomata reported by Kelly, thirty-three were double and fifty-seven unilateral.

More recent studies of Robert Meyer (1916) gave a histogenetic classification to ovarian tumors, following closely the morphological divisions of Pfannenstiel. Meyer placed the origin of all cited epithelial tumors from the germinal epithelium, "Whether this be in the form of the surface epithelium of the adult ovary or in that of remnants of the medullary rays, or the rete ovarii." (Howard C. Taylor) The pseudomucigenous tumors he ascribed to a teratomatous origin. Others had previously held to this view.

The belief was held by Von Recklinghausen that tissue of extra-ovarian origin, such as Wolffian remnants, was the source of these neoplasms. The studies of Goodall (1912-1920) in comparative embryology seems to have upset this belief, since he demonstrated that the tubules of the Wolffian body, once thought to invade the ovary during fetal life, never do so, but are met outside the ovary by tubules growing down from the ovarian cortex. (Taylor) Hanau proposed the theory that pseudomucigenous cysts are merely the over-development of the entodermal component of a teratoma. It was chiefly opposed by two theories, the first of which maintained that ovarian cysts were frequently derived from Mullerian duct rests, and the pseudomucigenous varieties were showing a development in the direction of the part of the Mullerian duct which forms the mucous glands of the cervical canal, (Kossmann) while the second asserted that the germinal epithelium with the aid of its facility for metaplasia could be transformed even into goblet cells.

Sampson, in 1921, took the view that endometrial implants in the ovary and peritoneum, with his demonstration of the surprising frequency of this occurrence, offered an entirely new theoretical source for the origin (explanation) of the cells in the ovary, which might produce neoplasms. This theory has met with considerable opposition. The case reported here assumes importance in view of the theories concerning the Mullerian duct origin of these tumors and also because of Sampson's views, since here we have in the same patient an adeno-carcinoma of the ovary, an adeno-carcinoma of the endometrium, and multiple leiomyomata of the uterus. To say the least, the relationship between the uterine and the ovarian growth is strong, and were it possible to state definitely the incidence of development it might be pos-

sible to determine the primary site of the disease.

This patient, Mrs. W. S., age 42, referred by Dr. Herman Mahaffey, had been bleeding rather profusely, and curettage was done to remove tissue for biopsy. Dr. Allen reported adeno-carcinoma of endometrium.

My examination revealed the uterus enlarged and nodular, also a mass in the left broad ligament the size of fetal head. Because of the pathological report a pan-hysterectomy by the abdominal route was performed. The mass on the left side proved to be a proliferating papillomatous adenocystoma of left ovary. The uterus showed a number of nodular leiomyomata and on section into the endometrial cavity a small irregular papillary mass presented, which was also pronounced to be adenocarcinoma.

An interesting feature of this case is the question of prognosis. In my experience a malignant papillary ovarian growth recurs very promptly, if at all usually within eight or ten weeks. There was no evidence of recurrence at my last examination on March 1, 1932.

In addition here, we have the danger of implanting into the wound some cells from the uterine malignant tissue. Such an accident occurred in one of my cases, a Nullipara aged 28, where the nodule on the cervix was scarcely large enough to be differentiated.

The pathologist report is as follows:

Gross Description: Specimen consists of the uterus, tubes and ovaries fixed in formalin when received, and the uterus has been opened on its posterior aspect. The cervix is scarred and its mucosa hemorrhagic. In it there are numerous retention cysts, one of which is 2 mm. in diameter. In the anterior wall of the body there is a spherical tumor mass measuring 5 cms. in diameter. It is intra-mural, but protrudes some into the cavity of the uterus, so that the latter is distorted. Sectioned surface shows pinkish gray, striated, hard structure quite similar to that of the leiomyoma. Attached to the serosa anteriorly over the body there are two similar, but smaller masses measuring 5 and 8 mm. in diameter. These are pedunculated; near the left broad ligament is another which is sessile in its attachment, measuring 5 mm. The mucosa of the uterus is folded and papillary over the posterior portion of the body. It is 4 mm. or so in thickness.

Right ovary measures  $3\frac{1}{2}$  cms. in longest diameter, contains several follicular cysts, one of which is hemorrhagic. The right tube shows no gross changes except for seven serous cysts attached to its outer coat about the mid-portion of the tube. These vary from 1 to 3 mm. in diameter.

The left tube is not remarkable except that there are three serous cysts similar in size attached to the serosa of its mid-portion.

The left ovary is represented by a spherical tumor mass which was opened before received and estimated to measure 15 cms. in diameter. The wall is smooth, variable in color from very dark red to light connective tissue color. The content is made up chiefly of necrotic tumor tissue, some of which is still attached to the wall in form of large, irregular, papillary masses. The wall of the cyst, which is apparently viable tissue, varies in thickness from 1 to 6 mm. This tissue is grayish in color, much like that of epithelium, except for a very small membrane of the outer surface. The area of attachment measures 6x2 cms. Ovarian tissue is not recognized.

Report of Dr. Jno. Allen.

Date 1-9-32

Dr. Sherrill

Patient, Mrs. W. S.

Specimen consists of Uterus, both ovaries, both tubes.

Uterus opened, tubes attached, one ovary attached. Intramural tumor, fibroid in character, 4x3 cm. Wall of uterus 3 cm. thick. Endometrium thickened, with small tumor masses attached, masses soft, adenomatous. Right ovary cystic, atrophied. Papillary cystic mass of left ovary.

Previously opened cavity filled with soft necrotic papillary adenomatous tissues. Tumor approximately 6x8 inches. Cervix, fibrocystic. Fibro-cystic cervix, with endocervicitis, chronic bilateral salpingitis.

Gross and microscopic diagnosis: Adenocarcinoma of uterus. (Endometrium). Fibroma of uterus. Papillary adeno-carcinoma of ovary (advanced).

Signed J. D. Allen.

Microscopy: (Dr. Miller): Tumor Mass: Sections from the large tumor mass in the wall of the uterus show it to be made up of smooth muscle parenchyma and a moderate amount of connective tissue stroma. The muscle cells are arranged in irregular bundles, but are all uniform in morphology. There is some hyalinization of the stroma, but it is not marked. A small portion of the adjacent uterine muscle is attached and is somewhat damaged by pressure.

Sections taken from the body and fundus uteri including the lining, show the latter to be replaced by tumor tissue which is epithelial in character. The cells are definitely tall columnar and are arranged in good gland formation, considering that it is neoplastic tissue. There is a very occasional mitosis. Invasion of the uterine wall by the epithelium is well demonstrated in many of the sections. There is practically

no papillary formation. None of the glands are filled with mucous, but some of them are distended with inflammatory debris. The epithelial cells are not ciliated. In the cytoplasm of a few of them there is globule of secretion.

Cyst: The outer portion of the wall is made up of connective tissue. It is quite vascular. There are a few infiltrating leucocytes and there is considerable recent hemorrhage and a moderate edema. The lining consists of a papillary gland-like structure composed of tall columnar epithelium and a small amount of connective tissue stroma. The cells are well formed over papillary strands or into acinous-like gland structures. There is an abundance of mucoid secretion. The cells are somewhat irregular in size, shape and staining reaction and also their arrangement in the glands, that is, there is a moderate lack of polarity. Mitoses are rather numerous. Invasion of the wall of the cyst by the epithelial cells is apparently taking place. The inner portion is necrotic. There are small portions of the tumor in the sections in which the gland arrangement is almost lacking and here the cells form small, irregular, solid masses. The stroma is a small amount of connective tissue, which is well arranged, but carries few blood cells; hence the great amount of necrosis of the central portion. Judging from the morphology of the two tumors, that is, the ovarian one and the one in the body and fundus uteri, it does not seem probable that the latter is a descendent of the former, for the following reasons: In the cyst the cells are less uniform in morphology than in the uterus. If the uterine tumor was an implant from the ovarian one, we would expect the converse. There are fewer mitotic figures in the uterine tumor. The gland formation of the uterine tumor is better than that in the ovarian tumor and we would expect the converse to be true if the uterine tumor had arisen from the ovarian one. The morphology then would indicate that these are two independent tumors.

Cervix: The cervix is eroded and there is some scarring. Glands are distended with secretion and in some instances a few leucocytes. A few leucocytes are also found in the stroma near the surface. Sections do not suggest that the uterine tumor has arisen from the cervix. However, there is a great similarity in the morphology of the cells in the two locations.

#### DIAGNOSIS

Adeno-carcinoma of the body and fundus uteri

Leiomyomata of the uterus

Endocervicitis, chronic

Papillary adeno-carcinoma of the ovary



Par-ovarian cysts, bilateral.

#### DISCUSSION

**J. D. Allen:** The original diagnosis of adenocarcinoma in this case, was made by me from curettings, and I was very much surprised after operation when I had the opportunity of viewing the gross pathology. As stated by Doctors Sherrill and Miller, there were unquestionably three distinct tumors or neoplasms. Dr. Miller and myself, independently arrived at the same pathological diagnosis. Dr. Miller has certainly beautifully demonstrated the microscopical pathology. The prognosis in this case is of especial interest. Papillary adenocarcinomas of the ovary, unless ruptured before or at time of operation, do not metastasize very readily. The prognosis of the adeno-carcinoma of the uterus, of course, must be guarded. I enjoyed Dr. Sherrill's discussion of the histology of these tumors and would like to ask the condition of his patient at the present time.

**Herman Mahaffey:** This patient was the wife of a very good friend of mine. She had been bleeding since July, 1931 with scarcely more than 24 hours freedom at any one time from this symptom. Until about three weeks before she presented herself to me, she had had no pain. When she did come to see me and gave history of this bleeding, together with the passing of "something" which she described was about the length and size of the finger, in November, there were several things to be considered. We considered first, miscarriage. Of course, at her age of forty-two years, never having been pregnant and having been married about five years, one could partly dismiss that, but not altogether. We also considered hypertrophic endometritis and gave some thought to ovarian cyst, carcinoma of the uterus and fibroid of uterus. Upon examining the patient, there was apparently a mass that extended to the umbilicus. I was unable to differentiate this mass from a cystic tumor of the ovary or of the uterus. Also, the examination was very, very painful to patient, especially on the left side. As far as I know, patient had had no fever. She was very anemic and weak, and had been unable to do her house work for several weeks. I advised patient to enter a hospital and have her uterus curetted for in this way we could make a diagnosis without making a mistake. I, myself, did the curettement. The first scrapings we obtained were not of the same type as those which came a little later; they were more or less grossly of the appearance of residual tissue and I hoped when we saw them that they were the result of a miscarriage. However, very shortly, some grayish-whitish, soft pieces of material began to come out, and I remarked to the anesthetist and Head Nurse that they appeared malignant, which proved to be true.

**Louis Frank:** I would like to ask Dr. Miller and Dr. Sherrill if the cells of the tumor in the ovary and the tumor in the uterus, were the same.

**A. J. Miller:** The two tumors are similar, that is, they are both made up of tall columnar epithelium arranged in gland formation, but there are some important differences. In the ovarian tumor there is more papillary growth than in the uterine one. In the ovarian tumor there is a great deal of mucoid substance produced by the tumor cells. This is absent in the uterine one. The ovarian tumor cells contain numerous mitoses and are more irregular in morphology than those of the uterine tumor. There is much less of the papillary form of growth in the uterine tumor than in the ovarian one. We would hardly expect the uterine tumor to have metastasized to the ovary by way of the uterine tubes, for, if so, there should have been implants elsewhere on the peritoneum. That was not the case. The difference in morphology would hardly support the view that the ovarian tumor was implanted on the uterine mucosa, since the cells of the ovarian tumor are more irregularly formed and contain more mitoses than those of the uterus. We should expect the converse if this had occurred.

**J. G. Sherrill,** (in closing): In regard to the progress of patient, there has been no further involvement.

The point brought out by Dr. Frank is an important one; namely, the relation of the small tumor in the endometrium of the uterus and the tumor of the ovary. These tumors grow somewhat rapidly and yet growth must have been going on over a period of months. When we consider that the uterine duct terminates at the end of the tube with this structure, the question we can understand is Dr. Sampson's viewpoint. He believes that the growth forms from cells of the endometrium which break away and are transplanted to produce tumors of the ovary. If they are ovarian tumors, they evidently spring from the ovary itself, in opposition to Sampson's theory, and that particularly has never been cleared up. The ovarian region is a very prolific field of battle. However, by careful study and interchange of views perhaps we may come to some solution of this problem. Howard C. Taylor's article in the November, 1929 S. G. & O. has gone into the subject very widely and it is the latest thought on this subject. This case might help clear up the subject if added to the literature of ovarian neoplasms.

The tendency to grow to the outside as a papilloma does not mean that it is malignant. Krukenberg, in 1895, reported a papillomatous growth from the ovary, which is now believed to take its origin from the intestine. This type of tumor must not be confused with ovarian papillary adeno-carcinomata.

POST-OPERATIVE PARALYTIC ILEUS  
WITH RECOVERY\*

WM. H. EMRICH, M. D.

Louisville.

The streptococcus demonstrated in this case Mrs. B. H., No. 1348 by culture and by the clinical history, weaves his own fabric; the history of which while not romantic is at least of great practical interest.

The following paragraph gives in concise form the meaty substance of what might be correctly termed standard symptoms in a large percentage of late gynecological cases.

My observations have taught me to anticipate the following sequence: In childhood, tonsillitis, scarlet fever, "growing pains," this term a misnomer for rheumatism. At puberty, a slowly developing menses, scant and irregular; and due to the streptococcus dysmenorrhoea progressive in type. During adolescence, continued dysmenorrhoea of dark blood with clots. During pregnancy, more reflex symptoms than ordinary; thin amniotic membranes, early rupture of the bag of waters, a dry difficult labor. At the menopause, uterine fibrosis.

I have repeatedly seen this chronological sequence of illnesses that I look upon it as a landmark.

In addition to the above history, this patient suffered general myalgia, kidney pains, gastro-intestinal distress, a damaged mitral valve however with good compensation. Tycoo 100/60. The entire abdomen on guard.

This patient is forty-one years of age. She is of the asthenic type. She has had seven deliveries, has six living children, one dead of summer complaint. One spontaneous miscarriage. Her father at eighty years of age, died of Bright's disease. Mother at forty years of age died of childbirth. One brother ill of stomach trouble. One sister had large ovarian cyst.

Catheterized urine, normal except for a trace of albumen. Wassermann and Kahn blood reactions negative. Haemoglobin 70%, coagulation 5 min., red cells 4,020,000, white cells 12,500. Other data negligible.

Diagnosis: Enlarged irregular uterus, undergoing fibrosis, very tender; General pelvic cellulitis.

March 13, 1931, this very sick woman was moved on a stretcher into the hospital. Temperature 99.2 to 101.5; pulse 96 to 108.

Pre-operative therapy: Phenobarbital, digitalis, morphine in 1/8th grain doses upon occasion. Fisher's alkaline drip for six to eight hours, with two-hour rest intervals, day and night. Concentrated liquid diet

every three hours, plenty of hot water per anum, bile salts and enemas.

This therapy clearly indicated would have been less effective and positively incomplete without the intelligent use of biological preparations, in this instance influenza-pneumonia vaccine, which converted an almost moribund patient into a state that called for a light diet, tonics and intravenous iron to pick up the load from there on.

Previously, I had informed the husband that his wife would probably not survive long enough to undergo surgery. However, within eight days, temperature and pulse were normal, patient stronger, brighter and outlook more hopeful.

Operation. On March 27, 1931, the fourteenth hospital day, under gas-oxygen-ether anesthesia, abdomen was opened through a low mid-line incision. Omentum and intestines were found adherent everywhere; both tubes and ovaries adherent in cul-de-sac, chronically inflamed; uterus large, fibrous, irregular and inflamed. Both tubes and ovaries were resected and a supravaginal amputation of the uterus done. Patient suffered a moderate shock.

March 29th, two days post-operative, tympany required eserine salicylate. Patient developed a septic sweat. Rectal tubes and low enemas were of no avail. Dyspnoea and emesis of green fluid. Oleum ricini, surgical pituitrin, digifoline, whiskey; and turpentine and cotton seed oil enemas accomplished nothing. Dressings changed to relieve tension.

April 1st, fifth post-operative day, normal saline and glucose were given intravenously, 800-cc at a time, repeatedly, to prevent dehydration. Patient was turned from side to side and even put up on a backrest.

April 2nd, sixth post-operative day, at 5 p. m. a consultation was held with Dr. Geo. A. Hendon. Gastric lavage advised. This was thoroughly done without any benefit. Temperature-102, pulse 112, respiration 22.

To stand at the bedside of a patient who should recover, yet to see them slowly slip away and to expire is like seeing a healthy vigorous, mentally alert, very good friend gradually sink and disappear into quicksand. May I add that living in a hospital for ten years with your post-operative patients will teach one many things not otherwise acquired.

Here was the situation: Almost a dead body with just a spark of life, that vital element which like electricity has not yet been analyzed. It was another instance of action, or ruin.

At 12 p. m., without moving the patient from her room, but under thorough aseptic

\*Read before the Jefferson County Medical Society, January 4, 1932.



precautions, using a 1% novocain solution, an incision one and one-half inches long was made through the center of the left rectus muscle just opposite the umbilicus. After going through a blind spot in the adherent omentum, about one inch of the presenting bowel was partially freed from its parietal contact. No attempt was made to free the entire loop, the adhesions not being disturbed in order to prevent extension of infection which would have inevitably resulted. The bowel was so thin it looked like tissue paper and could not be identified. A medium Moynihan tube was inserted through a minimum longitudinal puncture. There was an immediate escape of gas and fluid fecal material. The entire abdomen collapsed like a punctured balloon. Due to the sudden reduction of intra-abdominal pressure, my troubles were not yet over; however the successful outcome of this emergency measure cast its ray of bouyant sunshine, where before the horizon seemed all grey.

April 5th, three days later, mercurochrome solution introduced into the rectum to locate the site of intestinal drainage was very promptly expelled through the drainage tube anchored in the bowel, proving the emergency operation to be a colostomy at about midway of the descending colon.

Drainage was profuse. Raw edges of the wound daily massaged with the English preparation B. I. P. P. (bismuth, iodoform and parafine paste); this to prevent infection.

April 11th, nine days after emergency colostomy, patient had normal defecation after enema.

April 14th, twelfth post-colostomy day, drainage tube was removed. Two days later, April 16th, wound closed spontaneously.

At this writing the area is dimpled, due to the retraction of tissues. There is no hernia, no discomfort. Patient is completely recovered.

Just a word as to the need for exceedingly prompt action in unfortunate complication of this kind. The gastro-intestinal tract is physiologically divided into three parts: First the secretory portion, namely the stomach and the first part of the duodenum, which later receives the pancreatic secretion and the bile; this area is arterially supplied by the coeliac plexus. The second portion is the absorptive area, terminating at about midway of the transverse colon; this is supplied by the superior mesenteric artery. And the third and last part of the gastro-intestinal tract, physiologically speaking, which terminates at the rectum; this is the receptive or eliminative portion, arterially supplied by the inferior mesenteric.

In post-operative ileus the higher the obstruction the more toxic the symptoms and the more rapid the death. This is due to the loss of acid gastric salts in the vomitus. The blood chlorides become especially low and the chlorides practically disappear from the urine. In high obstruction without vomiting but accompanied by marked gastric dilatation, the gastric juices are just as definitely lost to the individual because there is no absorption in the stomach or proximal duodenum. Dehydration, alkalosis and death will follow continuous and complete loss of gastric juice. The total loss of pancreatic juice alone will cause dehydration and acidosis. Total loss of bile for long periods causes no marked chemical changes in the blood, and is compatible with life.

What usually happens is partial or complete loss of both gastric and intestinal juices causing alternating acidosis or alkalosis, in varying degree.

#### IN CONCLUSION

An enterostomy or a colostomy at any point in the abdomen, multiple if needed, may after all else is done for a moribund patient, prove well worth while. If the enterostomy is high then I would suggest another opening into the ileum or into the ascending colon. Drain the gastro-intestinal juices through a glass connected rubber tube into the second physiological portion of the intestinal tract for absorption.

Spinal anesthesia. Personally I know of one patient who was spectacularly relieved of acute intestinal obstruction by a spinal anesthetic.

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#### DISCUSSION

**B. F. Zimmerman:** Paralytic ileus may be the result of : (a) Peritoneal infection. (b) Embolism and thrombosis of mesenteric vessels. (c) Traumatic injury to the spinal cord. (d) A terminal condition in certain chronic diseases, cardiac, etc.

The case reported by Dr. Emrich would seem definitely to belong to group (a). In such a case, macroscopic evidence of peritonitis may not be present, but there is strong evidence to support the belief that bacterial toxins play an important role. I have had cultures taken from various parts of the abdominal cavity at autopsy, and in some of the fatal cases no growth was obtained.

In view of the fact that enterostomy gave such prompt relief, I am of the opinion that in

this case the intraspinal injection of novocain would have relieved the condition. The thoraco-lumbar sympathetic nerve fibres are the principal inhibitory nerves to the intestinal canal and at the same time they supply motor fibres to the internal anal sphincter. The vagal and sacral autonomic fibres are the motor nerves to the intestinal canal. Novocain, by anesthetizing the thoraco-lumbar segments removes their inhibitory effect, leaving the vagal and sacral autonomic action unopposed. At first glance, it would seem that the sacral fibres should likewise be anesthetized; but there is strong experimental and clinical evidence to support the belief that the sacral autonomic system can operate through its plexuses and ganglia independent of connection with the cord.

It has been our observation that with a firmly contracting internal anal sphincter, and the presence of some peristalsis, intra-spinal novocain is indicated. In this class of cases there would seem to be an irritation of the thoraco-sympathetic, producing an abnormal inhibition to the intestinal canal.

**Diabetes and Tuberculosis.**—Banvai presents an analysis of thirty-one cases of diabetes mellitus complicated by pulmonary tuberculosis. Tuberculosis complicating diabetes often has an insidious onset and larval, atypical forms. Unusual, subapical or perihilar localization is frequent; bronchopneumonic lesions dominate the picture. The cause of lack of symptoms and absence of physical signs in early cases may be sought in the nature and localization of the disease, and in the fact that acidosis is liable to mitigate or suppress allergic reactions and that in the aged (40.9 per cent of Joslin's diabetic tuberculous patients were 50 years or older) the symptoms of tuberculosis are often inconspicuous and the physical signs hard to detect because of physiologic changes characteristic of this age period. In the presence of respiratory or constitutional symptoms or signs, or when diabetes is well under control and the patient is still not doing well, the presence or absence of pulmonary tuberculosis must be ascertained by means of stereoscopic roentgenograms. When the pulmonary disease reaches advanced stages, symptoms become more manifest and physical signs more easily detectable. The author has never seen insulin cause any focal or constitutional reaction. The indications and contraindications for surgical intervention are the same as in nondiabetic patients.

## EXPERIMENTAL OBSERVATIONS ON PERICARDITIS WITH EFFUSION\*

SYDNEY E. JOHNSON M. D., AND MARTIN PALMER, M. D.

Louisville.

The clinical and x-ray findings in pericarditis with effusion have evoked a good many conflicting statements in medical literature. A large number of signs advocated by their authors, as of special diagnostic value, have found their way into standard systems of medicine. One of the most persistent of these is the sign described first by Rotch<sup>2</sup> in 1878. That was seventeen years before Roentgen's discovery of the x-rays, but Rotch's sign is still given in several modern text-books as one of the diagnostic signs of fluid within the pericardial sac. This sign, supposedly, appears as a rounding or obliteration of the cardiohepatic angle, indicated by dullness on percussion in the right fifth intercostal space. Considering the anatomical relations of the parietal pericardium with the central tendon of the diaphragm, a rounding of the cardiohepatic angle is exactly the opposite of what would be anticipated.

In order to determine more accurately what changes actually occur in the cardiac contour, with different quantities of fluid in the pericardial sac, a series of experiments was carried out, the main findings of which are given below. We are indebted to Dr. Robert Ball, of the Department of Pathology, for putting the experimental material at our disposal.

Seven autopsy specimens were used. The pericardial sacs were injected in situ from one to three hours after death. A ten per cent solution of sodium iodide was used as a contrast medium, and quantities from 100 cc. to 500 cc. were employed. Injections of 500 cc. gave such marked and characteristic changes that it was not considered necessary to go beyond this limit. Owing to the excellent contrast given by the medium, small quantities could easily be seen in any part of the pericardium. The bodies were strapped to a tilt-table and were screened in recumbent and vertical positions. Roentgenograms were also made in both positions.

In considering the results of our experiments we believe that the only data of any value obtainable by this method pertain to the cardiac measurements, i. e. the size and contour of the shadow cast by the contrast medium. We doubt the value of results obtained by percussion on cadavers and this method was abandoned after a few trials.

The cardiac measurements obtained with



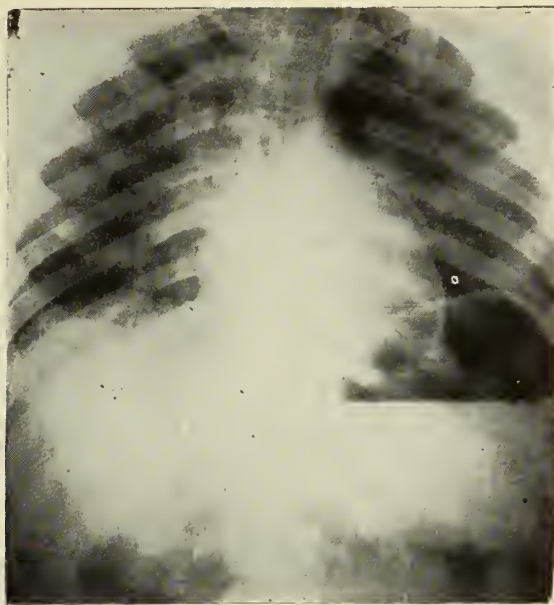


Figure 1. Cardiac contour before injection of opaque medium into pericardial sac. Note gas in stomach which permits clear visualization of the cardiac apex.

quantities of fluid of 100 cc. to 500 cc. are shown in the following tabulation:

Table 1. Cardiac measurements with different quantities of contrast medium in the pericardial sac.

The cadavers were of white and colored males, ages 22 to 45, and weights 135 to 160 pounds. Several showed moderate myocardial hypertrophy, which accounts in part for the increase above normal in the cardiac measurements before the injection of the opaque medium. There is also some distortion due to the use of a target-plate distance of 36 inches. These factors do not alter the ratios of the different measurements to an appreciable extent, and are, therefore, of little or no significance in considering the final results. A set of representative films is shown in figures 1 to 4.

Attempts to derive an index number from these measurements were not successful. The measurements which increase most rapidly are the *L*, *Ml* and *Ql*. All of these measurements increase at so nearly the same rate that a characteristic or index measurement appears to be out of the question.

Certain features in the cardiac contour and position, however, appear to be constant and fairly characteristic, viz: (1) depression of apex; (2) narrowing of cardio-hepatic angle; (3) widening in upper part of cardiac shadow.

In figure 1, the shadow of the apex lies at the level of the 9th rib, posteriorly. With the injection of only 100 cc. of fluid (Fig. 2) the apex dropped below the level of the 10th rib, and it is important to note that this level is held with further injections of fluid up to 500 cc. This finding indicates that

#### Case No. 1, in detail:

Amount of fluid in cc.	Mr	Ml	D (Mr+Ml)	L 18	Inside chest diam.	Q(r + 1)	Trans. Diam. at 3rd Inter-costalspace
None	5.5	9.5	15.	19	29	12	10
100	6	10.5	16.5	19	29	14	11.5
200	6	11	17	20	29	15	12
300	6	11	17	20.75	29	15.5	12.75
400	7	11.2	18	21	29	15.5	13
500	7.2	11.4	18.6		29	15.7	13.3
Averages of all cases							
0	4.7	9.3	13	14.5	29	11.2	10.5
100	5.5	10.3	15.8	17	29	13	12.2
200	5.7	10.5	16.2	18.2	29	14	12.7
300	5.8	10.7	16.5	19	29	14.5	13.3
400	6	11	17	19.2	29	14.8	13.7
500	6.2	11.2	17.4	19.5	29	15.2	14

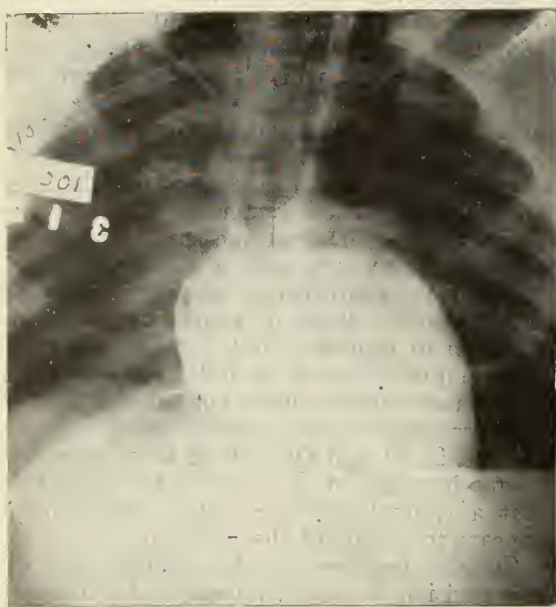


Figure 2. The same subject following injection of 100 cc. of opaque medium into the pericardial sac. Compare with figure 1, and note the marked depression at the apex.

under the conditions of the experiment a very small accumulation of fluid causes a decided drop of the cardiac shadow at the apex, and that there is very little change in this part of the shadow on further increase in the amount of fluid up to 500 cc. That the fluid accumulates first in the lower left part of the pericardial sac is shown in all of the injections regardless of the position of the body. Williamson<sup>3</sup> observed this depression of the lower left border both clinically and experimentally. He studied casts of gelatin masses which had hardened within the pericardial sac, and drew attention especially to the dullness on percussion (in patients with pericardial fluid) over this region. All of our experimental films show this depression very clearly. Failure to show it in some of our patients is apparently due to our inability to clearly differentiate the cardiac shadow from that of the structures which lie immediately below. If the stomach is partly filled with air, the position of the pericardial apex is often very clearly shown. The main difficulty encountered in attempting to demonstrate this sign in patients was due to the presence of fluid in the pleural cavity. In reviewing the histories of 19 cases of pericarditis with effusion, which we have examined in the past five years, we find that Williamson's sign was present in five cases, and that no mention is made of it in the other 14. It is likely that in most of the 14 cases, the sign was not sought.

A fallacy that has had rather wide circulation in medical literature is that the cardio-hepatic angle is obliterated in pericarditis with effusion. We have found narrowing of the angle, but never obliteration. The angle becomes more acute, as shown in figures 2 to 4. This is the natural result of the increase in convexity of the right border of the pericardium as it becomes distended with fluid. With the angle very acute, it could easily be mistaken to be obliterated, on percussion, as the amount of areated lung presenting anteriorly in this region would be diminished.

A feature of the pericardial contour which does not appear to have received sufficient emphasis is the widening of the shadow in the upper portion. All of our experimental films, and most of the films of proven cases, show marked widening in the upper part of the cardiac shadow, with abrupt narrowing to normal width where the pericardium is reflected onto the great vessels. In making this measurement, the 3rd interspace was selected as representing a satisfactory level. The most favorable level will vary somewhat in different subjects, but in most cases we did not find this variation to be sufficient to alter the final interpretation. The measurements with different amounts of fluid are shown in table 1. There was a maximum increase in this diameter of 4 cm. (40 per cent) with 500 cc. of fluid. The increase in *Mr* and *Ml* averages about 25 per cent with the same amount of fluid. The widening of



Figure 3. Cardiac contour following injection of 300 cc. of fluid into the pericardium.





Figure 4. The same subject following injection of 500 cc. of fluid. Compare with figure 2, and note that there is very little difference in level of shadow at the apex.

the cardiac shadow in the upper interspaces might be seen in the rheumatic type of heart disease, but in that case the apex would probably not be depressed, and there would not be the abrupt narrowing on the upper part of the great vessels. We have, therefore, four characteristics of cardiac contour and position which, occurring together, appear to be definitely diagnostic of pericardial fluid, viz: depression of apex, increase in acuteness of cardio-hepatic angle, marked widening in upper portion of cardiac shadow, and an abrupt narrowing of this shadow on the great vessels at the upper limit of the serous pericardium.

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**Treatment of Pernicious Anemia by Injections of Liver Extract.**—Harrington and Fleming report the results they obtained with the intravenous and intramuscular administration of a liver extract in four cases of pernicious anemia. This form of treatment produces a rapid and effective reticulocytosis in from three or four days. In one case it caused a sharp reaction, which, however, was in no way alarming. The authors believe that the intravenous administration of liver extract should be reserved for severe cases and may obviate blood transfusion. Ordinarily the extract should be given intramuscularly.

## THE PHYSICIAN AND PUBLIC HEALTH WORK\*

D. L. JONES, M. D.

Fulton.

It would be unkind and ungrateful indeed if I did not at this time extend to you any thanks and appreciation for the honor you have conferred in selecting me to the office as your President of the Southwestern Kentucky Medical Association for the past year. Also thanks to the committees for the success of the good work of the past year and in being able to secure the men of talent on the different programs of our meetings.

For the subject of the physician and public health work, it will be necessary to give a brief history of about fifty years in medicine and public health work. The physician a few years ago did all lines of work as there was but little surgery other than emergency surgery, but today when speaking of the physician we think of him as doing no surgery other than minor surgery. He refers to the different specialists, ear, eyes, nose and throat, cardiologist, dermatologist, gynecologist, gastroenterologist, tubercular specialist, orthopedic surgeon, obstetrician, diagnostician and surgeon. In fact anything that causes a real thought, the public now thinks they should go to one of the different specialists or a diagnostic center. Of late we have a new specialist, dating back twelve or fifteen years known to us as public health work or state medicine. Public health work with all of its units, public health physician, nurse, sanitarian and the lay units or helpers. When all is said, where is the field of work for the family physician? The only thing he has no competition for, is the 2:00 A. M. call or a call to the dead beat.

When I graduated in 1909 the physician had his library, not so extensive, x-ray was in its infancy, his equipment was limited. His patients learning to confide in him and with them he was the last word in medicine. If a consultant was called on a difficult case, he called a physician from his home town or a nearby town. If his patient died, his friends were confident that all was done for him that medical science knew and if he got well, the physician received great praise.

A few landmarks in medical science yet stand out prominent as Harvey's discovery of the circulation of the blood; Jenner's discovery of small pox vaccination; Dr. Ephriam McDowell and Dr. J. Marian Sims in surgery; Lister as the Father of antiseptics; Koch in 1882 discovered the tubercle-bacil-

\*Read before the Sixty-Third Annual Meeting of the Southwestern Kentucky Medical Society.

lus; Kleb and Loeffler the discovery of the diphtheria bacillus; Schaudin and Hoffman in 1905 discovered the spirocheta pallida and Pasteur discovered rabies vaccine and antivenin for snake bites in our present Volstead days; discovery of insulin for the diabetic and also last but not least, the x-ray. All of which has been in the last fifty years and the most of which has been in the last twenty-five years. The above discoveries are the nucleus for present status in medicine.

The advances in medicine and surgery are so fast we must be on the alert not to become obsolete. During the World War we were intermingling with the medical profession of the world and since that time medical science has made a great advance. Specialties preceding the war were in their infancy but since the war, specialties have increased, also group medicine and public health work or state medicine.

Today the question is with us, what are the duties of the public health workers, What are his bounds? I will speak of the public health work and state medicine interchangeably and will speak of organized medicine of which the physician is a member. State medicine or public health work is with us and here to stay. We should discuss their duties in our medical society and place bounds that they may not go beyond.

I have familiarized myself on public health work and it's advances in several different states of the Union and know that there is a feeling among the organized medical profession that state medicine or public health work is going beyond its bounds. I will endeavor to give in my opinion what should be the limits of public health work that would not be in conflict with the organized medical profession.

a—School inspection, and on this inspection noting the defects and making a report to the parent or guardian of the child's defects requesting that they be taken care of by their respective physician.

b—Venereal clinic for the indolent patients.

c—Small-pox vaccination for the indolent class of patients, and those who can pay provided they are not being cared for by the family physician, or refuse to be vaccinated and enforcement is required.

d—Quarantining of contagious diseases.

e—Inspection of food supplies, hotels, public buildings, and sanitation in general.

f—Children's clinic for the poor only.

g—Tubercular clinic for the poor only, but in event that a patient is examined in any clinic, found in need of treatment, able to pay a bill or receive credit, he should be referred to his family physician with a

report of his condition without being prescribed for.

h—Obstetrical clinics for prenatal care should be for the indolent class of patients only.

i—All public health clinics, be they medical or surgical should be held only by the wishes of the medical profession.

j—No public health physician or nurse should prescribe or suggest to any patient able to pay or receive credit from a reputable physician.

Any patient reporting to a clinic for free treatment should be questioned as to who his physician is, if he has financial means, able to work or receive credit before he or she is given free treatment. Too often the most influential in the town or county is given free treatment or advise in the clinics in order that an appropriation may be made for the health work, or that certain individuals of the public health unit may receive their appointment.

The average length of time for a physician in active practice is twenty-five years. In this country in 1800 the average length of life was thirty-three years; in 1885, thirty-nine and seven tenths; in 1901, forty-nine and two tenths; in 1910, fifty-one and four tenths; in 1920, fifty-six and three tenths; in 1924, fifty-eight and one tenth. A gain of about twenty-five years. This increase of twenty-five years in life is due in a great measure to preventive medicine for which every branch of medicine has contributed. Not only the public health work is practicing preventive medicine and added to the increase span of life, but the increase in medical science in all of its branches are adding to the span of years.

The public health work costs about ten thousand dollars to a county, paid by the county, state and federal funds and is not really taking care of the indolent class of work, but leaving that for the local physician. If this money was paid to the county for the support of a hospital and a part for pay to the physicians to take care of the indolent class of people, more physicians would locate in the country and small towns and receive better medical services.

Every physician should recommend vaccination, inoculation, periodical examinations and equip himself for making as complete examination as can be done by him and referring fewer patients away from his home town and when in need of consultation call a physician from his community, thereby gaining back the lost prestige of a few years ago.

I am quoting a few paragraphs from Dr. J. D. Brook, his Presidential Address to the State Medical Association of Michigan in



1930, on the subject of, "The Passing of the Family Doctor and Practice of the Future."

"There is perhaps no one condition which has contributed more to the elimination of the family doctor than the so-called free or hospital clinic. The class of patients who frequent these places are those once treated by the general practitioner, who when sickness overtook them were carried by their doctor until such time as they could save enough, after deducting living expenses, to balance the account. These people were usually a good class of citizen. They were thrifty and took pride in keeping themselves square with the world. But gradually as the clinic increased in popularity and as Jones and Brown received free service, and while the head of the family perhaps was temporarily out of employment, they too availed themselves of the services of the free clinic.

Nor do we exactly criticize this individual for availing himself of this service. Yet it is fundamentally and governmentally wrong and decidedly un-American for any group of individuals or organization to place before our people enticements which tend to pauperize and encourage dependence instead of independence as promulgated in the Declaration of our forefathers. It follows therefore that free clinics and social agencies are undermining the spirit of true Americanism and are breeding socialistic tendencies.

I have never yet received a satisfactory answer to the query—Why the free hospital clinic? A partial answer may be gleaned from the following incident which is self-explanatory. A physician on service at a clinic told one of the admitting officers that Mrs. Jones should go to her private physician and that Mr. Brown was properly a city charge. The attendant replied by saying "Why doctor, if we did that with those who come here I would lose my job." This reply is obvious and needs no further comment. But this is not a symposium on clinics. They are here doing a wonderful work even though suffering from abuses, and undoubtedly will remain until some other system supplants them.

How then shall the public in the future receive medical care? A national committee on the cost of medical care has been for more than two years at work attempting to determine the causes but they are still far from their goal. The report of this committee undoubtedly will largely determine the conduct of medical practice of the future. If the utterances of members of this committee, and particularly its chairman, Dr. Ray Lyman Wilbur, are of any significance, and I believe they are, I can see only one

outcome, namely, some form of state medicine.

From a news item I quote Dr. Wilbur less than a year ago as saying, "A new social significance for medicine—to give everyone, regardless of residence or economic condition, the best the profession affords, and to make medicine fit in with the other social forces so that its distribution will be uniform, is vital in this age of science and democracy." No system of state medicine could be better defined and when men of our own profession holding high official position in our government come out boldly with these statements, I, like Belshazzar of old, can see the handwriting on the wall.

At about the time of Dr. Wilbur's utterance came the following from Dr. Glen Frank, President of the University of Wisconsin; "Our only hope of a healthier nation, unless we go bag and baggage to state medicine, lies with the unselfish doctor who will consciously reduce his income by giving patients advice that may keep them from falling sick again." The inference is that state medicine will practically eliminate disease. If this were true the countries of Europe where the system is now in operation should be the healthiest in the world.

I have advocated for years and still believe that the truths of scientific preventive medicine as available today, properly taught in our public schools, will eliminate more disease than all systems of state medicine in existence or that ever will be concocted."

I am now quoting from Appleton Medical Service May and June issue, 1932 the following:

"The need for expansion of public health work in the United States is definitely indicated in a recent statement by the Committee on the cost of medical care, of which Secretary Ray Lyman Wilbur is chairman. Vermont, being two-thirds rural, was selected by the Committee for study as being fairly representative of a large part of the United States. The complete findings and recommendations of the Committee will be announced in the Fall of 1932.

The committee on the Cost of Medical Care has been investigating this matter for five years. For the solution of this problem a number of different plans have been proposed:

1. In small communities the hiring of or the contracting with a physician upon a yearly salary.
2. The organization of groups of physicians and the payment of their services by the community upon an insurance basis.
3. Community hospitals and staffs offering a medical and hospital service upon

a yearly payment of a definite sum per individual or family.

4. The organization of county medical societies of medical health centers and the payment for health service of the community on insurance basis.

5. Pay clinics.

6. Health insurance, voluntary and compulsory.

7. State Medicine.

If it should come to pass that we have state medicine establishing state hospitals to be under the control of public health physicians, specialists and surgeons. A system of medicine giving free service to those not able to pay and caring for those who are able to pay for a very small fee, that will surely mean destruction to the organized medical profession and bankrupt the government.

In the beginning of my essay I dealt with state medicine and the physician as conditions now exist, I shall now state in my opinion a system that would be more satisfactory to the medical profession and the public at large. The use of funds that are now paid by the federal, state and county government to help maintain a county hospital and a part as medical fees for charity. Said hospital should be under the jurisdiction of the medical profession and not a few public health officials.

I agree with Dr. J. D. Brook, in that preventive medicine should be taught in the public schools, that an adopted textbook of hygiene and preventive medicine be added to the public school course.

I hope that the State Medical Association will take action in the future and that the laws may be amended so as to give relief to the public and the medical profession at large.

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**Postural Reduction in Vital Capacity.**—Hamilton and Morgan present evidence that while the vital capacity decreases when one assumes the recumbent posture, the residual air remains constant. In the completely inspired position the size of the chest may increase in the recumbent posture. It would seem, therefore, that the lungs serve as storage for blood which is poured out of the dependent veins when one lies down. This conception is substantiated by the fact that when blood pressure cuffs are applied to the four extremities, and blood trapped in the arms and legs by raising the pressure in the cuffs to diastolic, there is a prompt and marked increase in the recumbent vital capacity, so that it may equal or exceed the vital capacity in the standing posture.

## ACUTE LEAD POISONING IN AN INFANT. CASE REPORT\*

JAMES W. BRUCE, M. D.

Louisville.

H. B., male, white, age 20 months. Admitted to St. Joseph's Infirmary November 17th, 1931. Birth history and previous medical history unimportant.

Present illness—mild indisposition for two weeks. Convulsions began suddenly at 10:00 a. m. on morning of admission and continued almost uninterrupted for twelve hours. Convulsions almost entirely hemiplegic, involving left side. Rectal temperature on admission, was 105.5. This gradually came down to normal.

R. B. C. 4,460,000 H. B. (Tal) 72%; W. B. C. 22,800, Polys. 81%, Eosin 1%. Many stippled red cells.

Fragility test normal. Hemolysis began at 0.4—complete at 0.3.

Urine cloudy and 1030. Albumin three plus, Sugar 0, Acetone 0. Microscopic: numerous casts, W. B. C. and R. B. C.

Chemical test for lead positive. Spinal fluid clear, no apparent increase in pressure. Cell count 9, globulin, faint trace, filament developed on standing 24 hours in ice box. Lead test positive.

Eye grounds negative. Lead line on gums not present.

November 18th, 1931, convulsions controlled by intramuscular magnesium sulphate intravenous glucose 50% and chloroform. Intensive Ca therapy started (Milk and CaCl<sub>2</sub> by mouth, Ca gluconate intravenously and intramuscularly.)

November 24th, sitting up and playing—weakness and incoordination of left side.

R. B. C. 2,760,000; H. B. 50%; Poly. 54%; Eosin 2%; W. B. C. 10,000; Baso. 4%; Lymph. 40%.

Very few stippled red cells in smear. Urine, amber, acid, 1030, Albumin, faint trace, sugar 0., Microscopic, occasional pus cell.

Test of drinking water used at home gave a positive test for lead.

December 15th 1931, Child normal in every way.

### DISCUSSION

Lead poisoning in children occurs often enough for us to bear it in mind. The usual source of lead is paint which has been chewed from toys, beds, play pens, etc. In the case under discussion careful questioning failed to disclose any source of lead other than the drinking water. A child just older than the patient had been complaining of headache

\*Read before the Jefferson County Medical Society. April 4, 1932.



and pains in the abdomen for some time. The other members of the family had been free of symptoms.

Lead poisoning is usually classified as acute and chronic. However, the so-called acute cases are usually acute exacerbations of chronic poisoning due to sudden liberation into the blood stream of lead which had been stored in the bones. The acute symptoms are usually enumerated as headache, abdominal pain, constipation, convulsions. Chronic symptoms are pallor, weakness, dizziness, anorexia, paralysis of certain extensor muscles, e. g. wrist or ankle drop. Basic stippling of the red cells occurs early and while not pathognomonic of lead poisoning is nevertheless a great help in diagnosis.

The symptoms of lead poisoning are caused by the toxic effects of lead in the circulating blood. The chief object of treatment is therefore to store the lead in the bones where it remains indefinitely as an inert mass. This is accomplished by giving large amounts of calcium. Milk and calcium lactate by mouth,  $\text{Ca Cl}_2$  by mouth and intravenously and  $\text{Ca gluconate}$  intravenously and intramuscularly are all good methods of getting calcium into the body. Free elimination by the bowel must be accomplished also. Complete storage of lead in the bones so as to render the patient free of acute symptoms will take several days.

The next objective of treatment is to gradually "delead" the patient i. e., to slowly get lead into the circulation so that it can be eliminated from the body. If this is done too rapidly, acute symptoms will recur and this frequently happens. There are three ways of getting lead from the bones into the circulation: (1) Producing a mild acidosis. (2) Producing a mild alkalosis. (3) Administration of potassium iodide. The production of mild acidosis or alkalosis requires the administration of acids or alkalis and also careful diet regulation. Potassium iodide can be given independently of diet and is therefore the simplest form of treatment. The occurrence of mild acidosis or alkalosis during acute infections accounts for the frequency with which symptoms of acute lead poisoning occur at these times.

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#### DISCUSSION

**Sam A. Overstreet:** Through the courtesy of Dr. Bruce, I was allowed to see this patient. He presented quite an interesting picture from the standpoint of diagnosis and treatment. It seemed to me that the crux of the treatment in these patients is the use of calcium in storing the lead. It has been shown that vigorous at-

tempts to eliminate lead at early stage, may result in death—such patients apparently having a lead encephalitis. Particularly is this usually followed by exacerbation of symptoms, when large doses of potassium iodide are given. The use of calcium, as Dr. Bruce has stated, is far more effective in relieving the symptoms immediately; but 3-5-drops of potassium iodide, over a long period of time, will de-lead patient much more satisfactorily without exacerbation of symptoms and causing the complications of encephalitis. Also, many other localized complications, such as orchitis, are not infrequent.

**J. J. Glaboff:** It is surprising to note that this patient had no demonstrable lead line. Stippled cells are occasionally found at onset of disease and then disappear until later in illness. The ends of the shafts of the long bones, especially at the anterior ends of middle sixth ribs, or the upper ends of humeri, lower ends of femora, upper and lower ends of tibiae and fibulae, lower ends of radii and ulnae sometimes show shadows which indicate deposits of lead. The density of the shadow is greatest at the ends of the bones where growth is the greatest. The dense shadow is accounted for by deposits of lead. In infants under one year of age sometimes congenital bone lues causes dense shadows at the ends of the bones; this is due to columns of calcified intercellular substance of the cartilage that form an interlacing network in the shaft beneath the cartilage. I would like to mention also that in Rickets, sometimes a shadow is cast which is due to healing. When one gets a dense shadow in the ends of the long bones after one year of age, it is usually assumed that this is due to a deposit of lead or phosphorus.

I appreciate having listened to this paper of Dr. Bruce's.

**Henry C. Hermann:** In regard to the previous statements on the deposits of lead in the long bones, the latter usually persists, or leaves evidence of the deposits of lead, throughout life. The increased transverse deposits in the ends of the long bones are not pathognomonic of lead poisoning although the fact that if such shadows do exist in the ends of the long bones, it aids one in narrowing the diagnosis to such conditions that cause striations in the ends of the long bones such as rickets which often causes these changes, and I believe that there is a slight difference in the characteristics of the markings due to lead poisoning and rickets. I also believe that the lines as a result of lead poisoning are more or less characteristic and are of great diagnostic value.

**James W. Bruce, (in closing):** In answer to Dr. Solomon's question as to whether we ever determined how lead got into the child's drinking water, the only way the family could

account for this was that they had had some plumbing done on some iron pipes and in this way the lead could have gotten in the water.

This child did not have a lead line on the gums. It is difficult to tell a case of lead poisoning from one of healing rickets. I showed a Roentgenologist these pictures and asked him what was wrong with them. He looked at them and remarked, "Well it looks like healed rickets."

#### TREATMENT OF CONGENITAL SYPHILIS WITH BISMUTH ARSPHENAMINE SULPHONATE (BISMARSEN)\*

THOMAS M. MARKS, M. D.

Lexington.

Until three years ago my results in treatment of congenital syphilis were so discouraging that I had almost reached the conclusion that the best way out for all concerned was for the infant to die as early as possible, but upon the arrival of Bismarsen and after overcoming my fear of large doses, even in infants as young as three weeks, continuous bi-weekly doses of  $\frac{1}{2}$  adult doses are seemingly well tolerated with remarkable results, in fact one infant now 5 months old who at three weeks had a most virulent infection with prolapsed rectum and high fever is now the object of envy of mothers with well infants.

In Bismarsen we have a combination of Arspenamine and Bismuth which can be given intramuscularly to infants in nearly adult doses without the untoward reactions and ill effects of the other arspenamines even when given in smaller doses according to age.

Case Report: September 22, 1930 I was called in consultation to see a boy 26 months old giving an acute history of two days duration. The child just began to show signs of irritability September 20th and during the 48 hours previous to my seeing him, had only slept at very short intervals and between times would just run at full steam from one room to another paying no attention to any one of the family and not answering to his name. He had eaten but little and had difficulty in swallowing. There was projectile vomiting at the time I saw him and an early ptosis of the left eye lid which the family had just noticed. The early history showed nothing relevant to present complaint except that 11 days previous to illness had fallen from porch swing upon concrete porch striking forehead. The child was practically unrestrainable and

physical examination was very uncertain.

General physical examination was essentially negative with the exception of several large impetiginous areas from scratching, ptosis of left upper lid and exaggeration of both knee jerks. No facial paralysis; negative Kernig and Babinski; neck slightly rigid; eye ground examination checked by Dr. W. N. Offutt showed 2D choked disc in left eye with slight neuro papillo oedema disc right eye. Dr. Offutt made tentative diagnosis of syphilitic disease; spinal fluid was clear, cell count 23; globulin 2 plus; Wasserman 4 plus.

September 25, 1930; Mercury rubs daily  $\frac{1}{2}$  gm. for 40 days were started and bi-weekly doses of .1 gm. Bismarsen for 16 doses and then .2 gm. for 4 doses. Rest period for 8 weeks and another series of .15 gms. doses for 24 doses bi-weekly. Then rest period of three months. Spinal puncture at the end of this period showed increased pressure 2 plus was clear; cell count 2; Globulin negative; Wassermann negative; Blood Wasserman negative; Fundus examination negative right eye; left eye disc essentially negative; evidence of old hemorrhage. Ptosis of left lid entirely gone after first six weeks treatment and practically of signs of brain pressure.

The child is now taking bi-weekly doses of 15 gms. for 4 weeks with 4 weeks rest until 24 doses are taken. This will complete his first 15 months treatment. The child is to all appearances normal and well. Am reporting this case for the rareness of brain gumma in one of this age and the most pleasing manner in which it responded to Bismarsen treatment.

**Oral Administration of Corticosuprarenal Extract.**—Britton and his associates demonstrate the effectiveness of corticosuprarenal extract given by mouth. It prolongs considerably and possibly indefinitely the lives of suprarenalectomized cats and brings about complete recovery from even the severest symptoms of suprarenal insufficiency, when given by the oral route. The low blood sugar values found in suprarenalectomized animals are markedly increased, and the high nonprotein nitrogen values and blood cell volumes are reduced toward or to the normal levels, during the recovery period. Animals that have refused food may be induced to eat within an hour after administration of the extract. These observations are in keeping with those produced by intraperitoneal injection of the material. Large amounts of the extracts, approximately three to five times the intraperitoneal dosage, were necessary by mouth in order to produce comparable results. Epinephrine given by mouth in similar concentration to that found in cortico-suprarenal extract, and also dextrose solutions, have no noteworthy effect on suprarenal insufficiency.

\*Read before the Fayette County Medical Society.



## THE OCCASIONAL OPERATOR\*

W. B. ATKINSON, M. D.

Campbellsville.

The picture of the occasional operator is usually painted as follows.

Definition: Malignancy of the body of medicine.

Etiology:

1. Desire for a fee.
2. Prevalent in both city and rural localities.
3. Develops in early medical life.
4. No seasonal variation.

Location: May originate in the tonsils, abdomen, rectum or extremities. Spreads rapidly to other parts of the body.

Symptoms:

1. Itching of the palms.
2. Delusions of grandeur.
3. Empty feeling in the pocket book.
4. No loss of weight.
5. A feeling of well being in the part affected.

Signs:

1. Atrophy of the Conscience.
2. Swelling of the head.
3. Anemia of the judgment.
4. Cough (up by others).
5. Rapid expansion.
6. Hyper-activity of the part.

Prognosis: Very grave for the body as a whole, less grave for the part affected.

Diagnosis: The diagnosis is made when one or more of the above mentioned symptoms are present in a younger part of the body, with the accompanying signs. Hyper activity is the most important of the signs, and leads to early and extensive metastasis.

Differential Diagnosis: This disease must be differentiated from the following conditions.

1. Crap shooting.
2. Playing the stock market.
3. Lottery.
4. Banco Kentucky.

Treatment:

1. Starvation.
2. Excision or amputation.

Case Report: Mr. New Born Medic. Age (medical) 3 years.

History and Experience: None.

Onset, one year ago when his first patient presented an abscess of the finger requiring lancing. One month later a second attack. This time a patient came with peritonsillar abscess and incision was done. A third attack came a short time later when first aid was given to a man who had lost a leg in a saw mill. Three weeks later a fourth attack

was suffered when a child sustained a stab wound of the abdomen through which viscera protruded. Other attacks have followed at intervals, the severity of which have varied. The last attack was one week ago when a patient was operated upon for a pus tube, and an ovarian cyst was found, and removed. This case is now far advanced and constantly growing worse. No hope for recovery.

A peculiarity of some modern paintings is that they may be reversed and retain as much intelligence as in their correct position. We shall take another view.

The occasional operator is none other than the general practitioner whom it is popular to laud at the present time.

The cause of the occasional operator is the same as it has always been: the need for someone to care for certain specific ailments in an intelligent manner. In a word, necessity. This happens to be the younger doctor since his training in this line has been more intensive.

In a profession that stands second to none in its altruism, the occasional operator is no more apt to do work for his personal gain alone than is his fellow practitioner in other lines. Any delusions of grandeur are of short life, as the next case takes care of this. The empty feeling in the pocket book is relieved all too rarely. The feeling of well being cannot exist without good results, since any bad results are met daily among his friends and neighbors.

The personal interest manifest by the general practitioner, and his conscientious efforts are too well advertised for comment here. Needless to say they have been exaggerated. Swelling of the head is more or less a necessity for the successful doctor. He must believe in himself before others will. Judgment is a quality hard to define. It is employed daily in varying degrees and fortunately we are not held responsible for 100 per cent perfection.

The true position of the occasional operator lies somewhere between these two views. In every community emergencies arise that require attention of a surgical nature. One or more doctors in that community should be able to care for such needs, when they arise. To do this to the best advantage that man must be accustomed to the use and handling of instruments other than in the occasional emergency that may arise. In the hands of the man who does some surgery, and who realizes his capabilities and limitations, the average patient upon whom he attempts to operate, will fare as well as in more elaborate surroundings. The attitude toward the occasional operator should be co-operative not obstructive, helpful not critical. He serves a useful purpose.

\*Read before the Muldraugh Hill Medical Society.

# A CASE OF MULTIPLE INTUSSUSCEPTION. (Quintuple)\*

CHARLES BARON, M. D.  
Covington.

D. M., a boy of 2 years, came into the hospital on December 24, 1930, complaining of pain in the chest and abdomen, fever, and vomiting. Previous to the hospital entrance day, he had been perfectly well. At noon the child suddenly ran to his mother screaming with pain and pointing to the lower anterior chest wall and upper abdomen. This attack lasted about a half an hour and towards the end he vomited. He had two other attacks of pain, but they were not associated with vomiting. Previous to his first attack, his bowels had moved normally in the morning. Shortly after the first attack of pain, an enema was given by his mother, and the movement was noticed to be slightly blood tinged.

When the child was brought to the hospital, eleven hours after the onset of the first attack of pain, the child still complained of intermittent pain. His temperature was 101.4 with a pulse of 92 and a respiration of 22. A physical examination did not reveal any abnormalities except a suggestive rigidity in the midline below the umbilicus. No tenderness was elicited. The wbc was 7,700. The urine was negative.

An exploratory laparotomy was decided upon. Opening the abdomen with a right rectus incision, the appendix was found to be only slightly reddened. After its removal, a digital examination of the bowel did not reveal a thing that was abnormal. Yet upon a painstaking examination with partial withdrawal of the small intestine, it was not until the jejunum was reached, that the seat of the pathology was seen. In the space of about 25 cm., there were five distinct intussusceptions, each about 1.3 cm. in length, in the usual direction, i. e., aboralward. They were easily reduced, presenting no apparent changes. The abdomen was closed without drainage. The patient made an uneventful recovery and left the hospital in 13 days.

## LITERATURE

A review of the literature revealed that the subject of multiple intussusception is practically never mentioned and in only a few textbooks is it discussed. It is quite common to see at post-mortem, multiple intussusceptions of the bowel, so-called terminal or agonal spasm having formed the multiple invaginations. Holt and Howland (1) call this condition intussusception of the dying. Babcock (2), Boyd (3), Holt and Howland (1), among others, state that multiple

intussusceptions are agonic and postmortem. However, none of the text-books mentioned the possibility of it occurring in a patient in a non-agonal condition and in one that was far from the state of being moribund. It has been pointed out that in agonic states, the direction is upwards, i. e., the intussusceptum travels oralwards into the intussusciens. However, Campbell and Kerr (4) state that in a few exceptional cases, true clinical cases of idiopathic intussusception occur in this direction. This has also been noticed by Holt and Howland (1). However, in the presented case, the direction was downward in the usual manner.

The only cases that I could find of a similar nature occurred in postmortem findings reported by Beeche (5) and Longstreet (6). However no report of clinical cases of multiple intussusception could be found in the available literature.

## CONCLUSIONS

A clinical case with recovery is reported of multiple intussusception. There were five in all, occurring in the jejunum, within a space of 25 cm. It is felt that this case should not be regarded as agonal or dying intussusception, but a true case of idiopathic intussusception.

Thanks is hereby given to Dr. J. D. Northcutt for permission to present this case.

Since the reading of this paper at the Campbell-Kenton County Medical Society on January 21, 1932, I found a report of three cases of multiple intussusception in the Guy's Hospital Reports for October, 1931 in which 363 cases of acute intussusception in children were reviewed at that hospital 1904 to 1927 inclusive. A personal communication from the author, Dr. H. G. Close, revealed that of the multiple type, two of the three cases were double and one had three intussusceptions, the last being all in the ileum.

In addition, a reference was found in this report on multiple intussusception by D. C. L. Fitzwilliams in *Lancet*, 1908, i, 628, who wrote an exhaustive paper on intussusception in which he reviewed all the available literature which included well over 1000 cases. On the subject of multiple intussusception, he states, "Instances where two or more invaginations occur in different parts of the alimentary canal were very infrequent. In 777 cases of intussusception in which the variety and site of the invagination were noted only 12 such cases were met. I have reference, however, to three other cases. (Homolle, *Bulletin de la Soc. Anatomique*, 1870, p. 269; D'Arcy Power, *Transactions of the Path. Soc.* 1886, p. 240; Waterhouse, *ibid.* 1898, p. 108.) Details were only given in 11 of the cases. In each case the intussuscep-

\*Read before the Campbell-Kenton County Medical Society



tion which showed the most changes either towards gangrene or irreducibility was presumed to be the primary and the others the secondary intussusceptions. On examination they were found to fall naturally into three groups. In the first group, which contains six cases, the primary invagination was in the region of the valve, while the secondary was higher up in the small intestine. In two of the cases the primary intussusception was double, each being examples of the third variety of double intussusception. In the second group, consisting of two cases, the primary invagination was in the region of the valve but the secondary was below in the large intestine; in one the secondary intussusception was retrograde. The third group comprised three cases and all the invaginations were situated in the jejunum; in two instances there were no less than four separate invaginations. They were all associated with the presence of multiple polypi. It may therefore be said that when multiple intussusceptions are present they are as a rule complicated by the presence of double intussusceptions in the lower part of the intestine or polypi in the upper part."

Thus eighteen cases of multiple intussusception have been found in the literature, but none quintuple in number, the most being four.

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**Postural Reduction in Vital Capacity.**—Hamilton and Morgan present evidence that while the vital capacity decreases when one assumes the recumbent posture, the residual air remains constant. In the completely inspired position the size of the chest may increase in the recumbent posture. It would seem, therefore, that the lungs serve as storage for blood which is purged out of the dependent veins when one lies down. This conception is substantiated by the fact that when blood pressure cuff are applied to the four extremities, and blood trapped in the arms and legs by raising the pressure in the cuffs to diastolic, there is a prompt and marked increase in the recumbent vital capacity, so that it may equal or exceed the vital capacity in the standing posture.

## FRACTURES INTO AND NEAR THE ANKLE JOINT\*

ORVILLE MILLER, M. D.

Louisville.

One can readily understand that fractures involving the lower extremity offer possibilities of greater subsequent physical handicap than when a fracture of like severity occurs in the upper extremity. The constant exertion of supporting, propelling and lifting the body weight, combined with the effect of torsions and strains of force peculiar to the normal function of the lower extremity, applied at an angle from the long axis of the bones, may frequently cause complaint of weakness and pain which would be unnoticed in the upper extremity which suffers no such strains. If one may complain of pain in an ankle in which the visible results of repair are splendid, it is needless to say, if fragments remain out of their proper position and a gross deformity is present, that the patient is likely to experience a proportionate amount of weakness and disfunction.

An exception to the rule is found occasionally. Especially is this true of children. The state of mind, the vigor of reparative processes and the condition of the body fluids, all, probably, have a direct bearing. Unless there is severe pain or a deformity which causes interference with his efforts at normal locomotion, a child accepts his condition as a part of the bargain, until nature in her kindness to youth makes restoration. Reparative processes are certainly more active in childhood and young adults, and healing and readjustment of structures are quickly accomplished if metabolism is not altered from some remote cause. Change in the normal properties of the body fluids because of the presence of chemical or bacterial toxins is presumed to be a predisposing factor in certain cases of repair with abnormality, e. g. chronic traumatic arthritis—not so frequently seen among children as among adults.

All authorities, I think, are fully agreed that in every injury about the ankle, the doctor in charge should take great care that he is fully informed as to the true condition of affairs. An x-ray is, therefore, to be taken at the earliest possible moment. Patients sometimes question the necessity of going to this expense when the injury is seemingly rather trivial. But because a person can walk on the injured ankle, or because crepitation and deformity are absent, do not constitute a valid excuse for not hav-

\*Read before the Third District Medical Society at Bowling Green.

ing an x-ray examination. And in the event that the Roentgenogram is refused, the patient should be willing to assume responsibility for a handicap following the unknown pathological condition.

Early x-ray affords early information. While some surgeons prefer to wait a few days until swelling and some of the sensitiveness have subsided, the author has found it infinitely easier to reduce a fracture, and to adjust the fragments in a more nearly perfect relationship to each other, during the first few hours than at any other time. The muscles do not offer resistance because of contractions, fibrous tissue which must be ruptured, has not formed, clotted blood has not even organized enough to form a membranous covering of the fractured surfaces and to interfere with reposition.

Ordinarily, the reduction in the first few hours following fracture is easily and painlessly accomplished under either local or general anesthesia. The author is very partial to the use of novocain, when no contraindication is present. And, if the patient presents himself in the office, the reduction is done on the x-ray table. Ten or fifteen c. c. of 2% novocain with Adrenalin, as put out in ampoules by some of the pharmaceutical houses, are injected into the hematoma after the needle of the syringe has come into contact with the fractured surface of the bone. In five or ten minutes, whatever manipulation that is necessary can be accomplished without attendant pain. Fixation is then applied and another x-ray examination done so as to have both lateral and anteroposterior views. If it is found that the fragments are not in position, other attempts are made until it is found that it is impossible to accomplish a closed reduction.

It is the belief of the author that whether by the closed or open method, the fragments should be replaced as nearly perfectly as possible. The slightest variation in the planes of the articulations of a joint so complex as the ankle, may be productive of disability. During reduction, one should bear in mind the position and attachments of ligaments and tendons and the characteristics of the adjacent joints, whose alteration may influence the final recovery.

Ligaments lend themselves to very useful purposes in aiding reduction quite frequently. One of the most notable examples of this is in the case of Pott's fracture. The lower fragment, at its upper end, is practically always drawn toward the mid-line of the body, allowing a spreading of the mortise joint formed by the fibula, tibia and astragalus. In order to prevent disability from this source, one seeks to maintain the normal appearance of this joint. By inverting the foot

forcibly, so as to cause the sole to look inward, enough stress may be put on the calcaneo-fibular ligament to bring the fragments of bone into alignment. This position can easily be maintained by a plaster splint, moulded to the foot and leg and bandaged in place, while the foot is held in as much adduction as possible. However, one should not lose sight of the fact that the foot should at the same time be kept at a right angle to the leg, in order to avoid contraction in the Tendo-Achilles. If both malleoli have been fractured and separation has taken place, only an open operation and fixation of the fragments by means of a bone peg, or otherwise, can be depended upon to prevent a weakened and troublesome ankle, in the majority of cases. When fixation is applied in this type of case, the foot is held straight and at a right angle to the leg and not in either inversion or eversion. Pressure should be made on both malleoli to aid in maintaining their proper position in relation to other bones.

When the internal malleolus is fractured near its tip and the small fragment becomes separated, it is necessary to do an open operation, in order to accomplish reduction and fixation, as a usual thing. We have seen some ugly deformities and painful disabilities following this fracture, which necessitated operative correction. But without separation, the fragments may be held in approximation by inversion of the foot if the tip of the malleolus is fractured. If the fracture line is above the internal malleolus, it may be necessary to utilize the pull of the deltoid ligament by placing the foot in eversion.

Fracture of the os calcis, while it cannot be truly considered a fracture of the ankle, often interferes with the proper function of this joint. It has been the writer's experience that practically every case of fracture of the os calcis has a greater or less, amount of permanent disability. When there is an accompanying interference with the ankle function, it is usually due to an alteration in the calcaneo-astragaloid joint which produces an abnormal flattening of the lateral arch and subsequently excessive strain on the deltoid ligament, or, it is due to impingement of bone fragments on the tip of the fibula.

We have come to believe that the easiest way to treat fractures of the os calcis, is to unlock whatever impacted, misplaced fragments there are. Tenotomy of the Tendo-Achilles may be done before this manipulation, or afterwards, depending on what the type of fracture is. The fragments are moulded together then and by repeated heavy blows with a mallet they are impacted in the proper position. The foot is then placed in marked inversion and held so by a properly applied plaster of Paris dressing. Formerly,



it was our custom to do an arthrodesis between the astragalus and os calcis on all fractures of this bone. We are now disposed to reserve the open operation for those older fractures which cause disability severe enough to warrant this procedure. If the fragments are properly moulded there should be no impingement against the fibula and if the foot is strongly inverted there should be no symptoms of foot strain.

The length of time of treatment of fractures of this portion of the body seems to be rather important. It is believed that many disabilities are present because of too short a time of fixation. Possibly, one can maintain fixation too long, but this is very unlikely in the average case. The plaster of Paris dressing may be cut along the inner and outer aspects of the leg and foot and the edges pried apart to permit inspection of the extremity after a week's time. Light massage, by the finger tips and gentle rubbing with alcohol, are also permissible. The patient is encouraged to move the toes actively, in order to improve circulation. But weight bearing is not allowed until firm union of the fragments has taken place. Some surgeons prefer to incorporate a walking iron in the plaster in order that the patient be ambulatory. This apparatus is made of strap iron, bent into an hairpin shape. A cross piece about three or four inches long is welded at each end of the iron. It is long enough to reach from the knee to a distance of about two inches below the sole of the foot. After two or three plaster bandages are wound around the foot and leg, the iron is put in place and other bandages applied to incorporate it solidly between their layers. When the plaster is thoroughly dried and the shoe on the well side raised two inches, the patient is allowed to get up and walk about. If the plaster is properly fitted, the weight of the body is borne on the bandage at the knee and no stress whatsoever, on the point of fracture.

After six weeks the bandage may be removed, but no weight bearing allowed for two weeks more at least. During these two weeks the patient receives massage and passive motion. Dorsiflexion is the most difficult active motion to regain. Particular attention should therefore be given this important movement. And passive motion should never go beyond the point of pain.

Alternating hot and cold plunges for the ankle is of great benefit at this stage of treatment. The patient is instructed to provide himself with two large receptacles, deep enough to permit emersion of the extremity half way up the calf of the leg. One is filled with water as hot as the patient can stand,

and an equal amount of cold water put in the other. The affected foot and leg are put in the hot water for one or two minutes and then plunged into the cold water. This is repeated for a period of about fifteen minutes daily. Diathermy is also valuable. In the opinion of the writer, it supercedes, with the exception of massage, all other forms of physiotherapy.

For those who do not have access to an x-ray laboratory, Kellogg Speed has laid down fairly conservative rules for weight bearing following ankle fractures, as follows:

"External malleolus alone below joint level, after eight weeks.

External malleolus alone above joint level, after eight weeks.

Internal malleolus alone at or above joint level after eight to twelve weeks.

Bimalleolar fractures, after twelve to sixteen weeks, depending on the extent of fracture and amount of pain and swelling."

As stated, these are considered conservative rules. Were it not for exceptions, rules would be axioms, and the exceptions are frequent enough to fully warrant the assertion that a patient should not only have an x-ray examination immediately following injury and immediately following reduction of a fracture, but also, immediately prior to dismissal from treatment. In this way only, can we guard against many disabilities that are the result of unrecognized, improperly adjusted and incompletely united fractures. Weight bearing, allowed before the x-ray shows complete consolidation of the callus and the obliteration of any fracture lines extending into the joint may cause very serious consequences, in those, especially, of the arthritic tendency, or those of the acid tissue type.

In summing up, the statements are made that:

1. Disability is more likely to follow fractures near or into the ankle joints of adults than of children.

2. The true condition should be recognized early. Prompt adjustment of the fragments should be accomplished.

3. Fixation should maintain the proper relationship between the fragments and between the joints.

4. The length of time of fixation and non-weight bearing should be adequate to permit bony consolidation and to avoid roughening of joint surfaces by sharp edges of fracture lines.

5. X-ray examinations should be done before treatment, during treatment and at the time of dismissal.

# Kentucky Medical Journal

Published Monthly By

THE KENTUCKY MEDICAL ASSOCIATION  
Incorporated

Entered as second class matter October 22, 1906, at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price .....\$5.00  
Edited Under Supervision of the Council

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NEXT MEETING LOUISVILLE  
OCTOBER 3, 4, 5, 6, 1932

## COUNTY SOCIETY REPORTS

**Mason:** The Mason County Medical Society met Wednesday evening, March 9, held at the office of the Mason County Health Department. Clinic at 4 p. m., meeting at 8 p. m.

The meeting was called to order by the president, Dr. L. H. Long, Wednesday evening, March 9th, 1932. The following doctors were present: Brand, Hord, Stark, Colvin, Samuels, Taylor, Quigley, Morgan, and Murphy. Dr. H. Jerry Lavender president of the Cincinnati Dermatological society was the guest of the society and lecturer of the evening.

Minutes of the previous meeting, and the treasurer's report were read and approved as read. The president reported that Dr. A. R. Carrigan wanted to hold a joint meeting with the Adams County Ohio Society, and ordered the secretary to get in touch with Dr. Carrigan and make the necessary arrangements. The meeting was then turned over to Dr. Lavender, who gave an excellent lecture on Ringworm, in its various phases, and illustrated same with lantern slides. Every phase of the subject was completely covered. Among others things Dr. Lavender said that "Athlete's Foot" was probably the most interesting form of ringworm, that we see today, that it was on the tongue of every layman as well as every physician, and that the Government was now doing some systematic investigating.

Everyone, not only enjoyed it, but expressed themselves as having been benefited greatly by the lecture and hoped that Dr. Lavender would return soon with another lecture. So many questions were asked after the lecture that the meeting did not adjourn until after eleven o'clock.

The clinic held in the afternoon was attended by nineteen patients, and many of the doctors of Maysville, and one from Germantown. An excellent dinner was enjoyed by Dr. Lavender and the doctors attending the clinic. Dr. Lavender also saw some patients in the doctors' offices between the dinner and the meeting.

A. F. MURPHY, Secretary.

**Jefferson:** The 666th State meeting of the Jefferson County Medical Society was held in the City Hospital, Monday, June 20, at 8:00 p. m. After an interesting program the delegates and alternates were elected for the State meeting.

The Society adjourned until September, this being the last meeting of the year.

U. H. SMITH, Secretary.



# KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL 30 No. 8

BOWLING GREEN, KY.,

AUGUST, 1932

## THE EYE, EAR, NOSE AND THROAT SECTION

Elsewhere in this issue the JOURNAL is publishing the complete proceedings—papers and discussions—of the latest meeting of the Eye, Ear, Nose and Throat Section. This is in accord with the policy consistently pursued since organization of the only special section of the Kentucky State Medical Association.

The 1931 meeting, scheduled to be held in Bowling Green, had to be postponed because of the tragic deaths, in an automobile accident, of Dr. J. A. Stucky, Lexington, and the guest speaker for the occasion, Dr. R. C. Lynch, New Orleans, Louisiana. At the time, some sentiment developed for abandonment of the Section. Happily, however, the Section met later in the year at Lexington, contemporaneously with the annual session of the Kentucky State Medical Association, and this meeting so signally emphasized the value of the organization that it was decided to continue the Section, with annual sessions during mid-year.

The wisdom of that decision is conclusively shown, as you will doubtless agree after reading them, by the proceedings and papers at the latest meeting. Not in years has there been a better attended or more successful session.

Those composing the Eye, Ear, Nose and Throat Section are carefully selected by the Section's Board of Censors. All of them devote their time exclusively to the practice of their specialty. The JOURNAL extends congratulations to the Section in particular and to the Kentucky Medical Profession in general, upon the decision to continue this highly valuable organization.

## THE PRELIMINARY PROGRAM

For the benefit of our new and re-instated members, we are again carrying, elsewhere in this issue of the JOURNAL, the preliminary program for the Eighty-Second Annual Meeting of the Kentucky State Medical Association, which will be held in the Roof Garden of the Brown Hotel, October 3rd-6th.

Each month we re-instate many delinquents who, for some reason, failed or neglected to pay their dues on or before April 1st, the date on which we are compelled, under the

postal regulations, to drop all those in arrears. The membership this year compares favorably with that of last year, but it should be even better. The more or less enforced leisure occasioned by the prevailing economic strain and stress should give more time for reading, and the JOURNAL, it should be remembered, is the expression in print of the Medical Profession of Kentucky.

## THE ST. JOSEPH INFIRMARY CANCER CLINIC

Science has yet to find a solution to the problem which cancer presents. It has been the most stubborn of the diseases to treat and is responsible for approximately 100,000 deaths yearly in this country. During the past thirty years it has shown a steadily increasing incidence. In the last two years, under the impetus afforded by the activities of the American College of Surgeons and the American Society for the Control of Cancer, ways and means have been advanced for attacking the problem in a co-ordinated and vigorous manner.

These, briefly, consist in the education of lay people, the establishment of Cancer Clinics and Cancer Research Institutions and the correlation and co-ordination of all medical activities concerned in the recognition and treatment of the disease. It is believed that the service rendered to lay people by such agencies will mean an appreciable saving of life and that the accumulated data will greatly augment our present knowledge, both of the disease and of the methods of successfully combatting it.

The Cancer Clinic in St. Joseph Infirmary was opened to the profession and the public on Thursday, May 19, 1932. It is operated and governed under the rules and conditions set forth as minimum requirements by the American College of Surgeons. This minimum includes a staff comprising representatives of each of the medical specialties, selected from members of the hospital staff; facilities for any and all of the technical procedures in making complete examinations; and an adequate amount of material for the application of radiant energy. Full records are kept on prescribed forms, so that ultimate results in all forms of the disease may be known and tabulated. The clinic is held each Thursday at 8:00 A. M. and is con-

cerned only in patients presenting cancer or lesions which are generally recognized by the profession as "precancerous."

When an examination has progressed sufficiently far to rule out the presence of cancer, no further service will be given. The service of the clinic in making a diagnosis is free. No charge is made, regardless of the extent or character of the examination required, including cystoscopy, bronchoscopy, biopsy, and x-ray studies. When all available data upon a patient has been secured, the case is considered in staff conference and a decision reached as regards diagnosis and treatment. A report is sent to the family physician designated by the patient. In order to protect both the family physician and the clinic, it will be an invariable rule to send such reports. The family physician may then assume responsibility for treating the patient himself, of referring the patient to a specialist of his own choice or of sending the patient back to the clinic for treatment and observation.

A limited number of beds are available for charity patients, to whom no charge will be made for any character of treatment required. Charge for hospital maintenance and for professional service will be made to those able to pay. Professional service, in both charity and pay patients, will be rendered by the staff member to whom the patient is allocated by the staff conference.

Accurate follow-up, with periodical examinations, will be made of patients under treatment, to the end that, with accumulated statistics, a better evaluation of all known methods of treatment may be had. Since the activities of the clinic are centered upon one disease, namely cancer, and its purpose comprises its diagnosis and treatment, it is hoped that it will afford opportunity to the profession to acquire knowledge concerning it. Family physicians of patients, and physicians interested in cancer as well, are welcome to attend the eight o'clock staff conferences held each Thursday morning.

The JOURNAL welcomes the St. Joseph Clinic in the same confident spirit in which it welcomed the Norton Memorial Clinic. Both are designated to help meet, and both may be reasonably expected to contribute materially towards filling, a real need, not alone in Louisville, but in the State at large. We congratulate those responsible for the establishment of these clinics in particular and the Medical Profession of Louisville and Kentucky in general. Especially do we congratulate the people of the city and State, who will be chief beneficiaries of these well-directed efforts to check the steadily mounting ravages of cancer.

## PREVENTION AND CURE OF PELLAGRA

The occurrence of pellagra is a certain indication that for some reason there has not been included in the diet, or has not been consumed, enough of the pellagra-preventive vitamin. This substance is unequally distributed in the natural foods and foodstuffs. Some are so rich in it that when any one of them is added to the usual diet in reasonable quantity, pellagra will be prevented or will disappear if it has already occurred. Among these the Milk (including sweet milk, buttermilk, skim milk, canned evaporated milk), lean meats and fish (including beef, canned corned beef, liver, canned salmon, and canned haddock), Vegetables (including turnip greens, tomatoes, English peas, and perhaps also collard greens and other green vegetables which have not yet been studied in detail). Yeast and commercial Wheat Germ have been found to be rich in the pellagra-preventive vitamin, dried yeast being its richest known source.

Other foods carry the pellagra-preventive vitamin, but in smaller quantity, and when used alone to supplement a pellagra-producing diet may not quite meet the requirements. However, if they are used in combination with one another, or where the diet is fairly well supplied with this protective substance from other sources, a liberal allowance of one or more of these foods will be found satisfactory. This group includes dried beans (navy bean and red kidney bean), peas (black-eyed pea and the common cowpea), canned spinach, green cabbage, and green beans.

A large number of foods have been found to be such poor pellagra preventives that they may not be depended upon, regardless of the quantity or combinations used. These include corn meal, white flour, rye flour, oatmeal, molasses, cane sirup, sweet potatoes, mature onions, carrots, rutabaga turnips, salt pork, lard, cottonseed oil, butter, and gelatin.

The pellagra-preventive foods are also curative foods; but in severe cases they must be used in modified form. Instead of fresh lean meats, it is often advisable to begin with beef juice, or soups and broths made from fresh meat. Milk is perhaps the most valuable food in the treatment of pellagra, as it can be taken satisfactorily in cases where other foods are not tolerated. Pellagra tends to upset the digestive system, and the capacity of the patient to take or assimilate food is often very much reduced. It is frequently advisable to begin with very small quantities at frequent intervals, the allowance being increased as the patient recovers



the power to digest food. There is no drug known that has any curative or preventive value in pellagra; supplying the food factor, the absence of which causes it, is the only method by which recovery can be brought about. Particular care should be exercised to see that these foods are taken in sufficient quantity and with sufficient regularity. With suitable dietary supervision the average case, if uncomplicated, should recover in from six to twelve weeks.

Pellagra, being dependent upon the character of the diet, may return, of course, if the preventive or curative foods are not continued. To avoid further trouble from this disease, preventive foods must be eaten at all seasons. It is often hard to secure foods of this character in the rural districts, especially during the late winter and early spring. This can be overcome to a large degree if the people involved will make it a point to produce as much of their food supply as possible. Some can secure and keep a cow, and thus provide themselves with a constant supply of milk; others can keep poultry for food purposes; while nearly all can grow, easily and cheaply, one or more of the vegetables having preventive value—such as turnip greens, peas, etc. There is usually little advantage in discontinuing foods on which pellagra has developed, except to make place for those known to be a protection against the disease. The idea always should be to increase the variety used by supplementing rather than displacing, the line of foods to which the patient has become accustomed.

### THE CROSS-EYED CHILD

At the recent annual session of the American Ophthalmological Society, held in New London, Conn., one of the subjects under discussion was the management of squint.

In the early days of eye surgery, the turned eye which would not straighten by the wearing of glasses or under other conservative measures, was subjected to a tenotomy of the muscle which was rotating the eyeball excessively. The tendon was merely severed from its scleral attachment, thus allowing it to recede and reattach itself to the sclera at a point more remote from the cornea than its original attachment and so lessen the arc of rotation.

Theoretically, this operation was based on sound principles. However, its weakness was in that the point of reattachment could not be controlled and that an insufficient correction or an over correction, with deviation of the eye in the opposite direction, frequently followed this operation. This led to the adoption by most ophthalmic surgeons of surgical procedures which offered more defi-

nite means of securing perfect cosmetic results. Instead of setting back the strong muscle, surgery was applied to the antagonist or weak muscle, having for its purpose either the removal of a portion of the muscle and reattachment of the shortened muscle to the site of its old attachment or in suturing the severed tendon to a point closer to the cornea, thus increasing its arc of rotation. The amount of effect could be fairly well estimated with a conscious patient; hence, surgery was delayed by many operators until the patient was old enough to co-operate under a local anesthetic. Now, many operators are reverting to the tenotomy; not, however, in the old way of allowing the severed muscle to reattach at random—"in the dark" as it were, but by suturing the muscle to the sclera back of its old insertion. The operation, spoken of as a recession, can be gauged fairly definitely by measuring the amount of squint clinically present and by computing the amount of mechanical recession in millimeter graduation necessary to overcome a given amount of squint. Thus, the surgeon may operate under a general anesthetic, enabling surgical correction of squint at an earlier age than was feasible in the operations of advancement and resection under local anesthesia.

Perhaps, the greatest advantage of an early operation is to overcome at as early an age as possible the self consciousness incident to the cosmetic disfigurement of a turned eye. Children with crossed eyes often grow to be timid and acquire a "hangdog" expression on account of their apparent inability to look one straight in the eye.

The possibility of improving vision in the defective eye and of securing binocular single vision is also to be considered in securing early parallelism of the eyes.

As in many other operative procedures, one operation cannot be employed in exclusion of others, the problem resolving itself into the selection of the procedure best adapted to the existing conditions.

It must not be understood that conservative measures in the treatment of squint are to be abandoned; for a large percentage of children with such defect can be spared an operation by the early use of correcting glasses and by instituting muscle exercises and orthoptic measures. However, in the event such measures fail to improve conditions after a conscientious trial of from 6 to 8 months and the child has reached the age of 6 or 7 years, at which scleral suturing can securely and safely be accomplished, surgical interference should not only be suggested but urged.

A. O. PFINGST.

**OFFICIAL ANNOUNCEMENTS**

PRELIMINARY PROGRAM KENTUCKY STATE  
MEDICAL ASSOCIATION, BROWN HOTEL  
October 3-6, 1932

**GENERAL MEETINGS**

TUESDAY, OCTOBER 4TH, 9 A. M.

Call to Order by the President.

Invocation.

Address of Welcome.

Response Address of Welcome.

Installation of President.

1. Acute Gall Bladder Disease, W. H. Smith, M. D., Danville.
2. Radiation of Uterine Cancer,
3. The Treatment of Compound Fractures, C. R. Petty, M. D., Lynch.
4. Treatment of General Infection with Blood Transfusion, Carl Norfleet, Somerset.

SPECIAL ORDER AT 12 M.

Oration in Surgery, R. Glen Spurling, M. D., Louisville.

TUESDAY, 2 P. M.

1. Relative Value and Dangers of Spinal and Inhalation Anesthesia, W. R. Pinnell, M. D., Lexington.
2. Diagnosis and Treatment of Injuries of the Abdomen.
3. Lung Abscess and Its Treatment.
4. Stricture of the Urethra in the Female, W. T. Briggs, M. D., Lexington.

PUBLIC MEETING AT 8:00 P. M.

CRYSTAL BALL ROOM

TUESDAY, OCTOBER 4TH

President's Address, Philip F. Barbour, M. D., Louisville.

Annual Oration, John Lovett Morse, M. D., Boston, Mass., President, American Academy of Pediatricians.

WEDNESDAY, OCTOBER 5TH, 9 A. M.

1. Case Reports (Limited 8 minutes each)
  - a. Carotniemia, Winston U. Rutledge, M. D., Louisville.
  - b. Bronchretosis, J. W. Scudder, M. D., Calhoun.
  - c. Leprosy in Louisville, L. H. South, M. D., Louisville.
2. Diagnosis and Treatment of Empyema of Childhood, Clark Bailey, M. D., Harlan.
3. Malpractice Suits, J. B. Lukins, M. D., Louisville.
4. Symposium on Anemias (Limited 10 minutes each).  
Diagnosis and Treatment of:
  - a. Pernicious Anemia, J. H. Holbrook, M. D., Paintsville.
  - b. Agranulocytosis, Carl H. Fortune, M. D., Lexington.
  - c. Lymphatic Leukemia, Thomas J. Marshall, M. D., Paducah.
  - d. Indications In Anemia for Surgery of the Spleen, Austin R. Quigley, M. D., Maysville.

SPECIAL ORDER AT 12 M.

Oration in Medicine, Charles N. Kavanaugh, M. D., Lexington.

WEDNESDAY, 2 P. M.

1. Etiology and Treatment of Asthma in Children.
2. Calcium Metabolism in Health and Disease, James E. Winter, M. D., Louisville.
3. Relation of Ear, Nose and Throat to General Infectious Disease, A. L. Bass, M. D., Louisville.
4. Symposium on Obstetrics (Limited 10 minutes each)
  - a. Pregnancy and Its Complications, Lee C. Redmon, M. D., Lexington.
  - b. Labor and Its Complications, B. S. Rutherford, M. D., Bowling Green.
  - c. Puerperium and Its Complications, N. C. Witt, M. D., Franklin.

THURSDAY, OCTOBER 6TH, 9 A. M.

CONDUCTED BY THE UNIVERSITY OF LOUISVILLE

1. Radical Treatment of Joint Tuberculosis, R. L. Woodard, M. D., Louisville.
2. Relief of Prostatic Obstruction Through the Urethra, E. Owsley Grant, M. D., Louisville.
3. Subject delayed, C. B. Willmott, M. D., Louisville.
4. Studies on Circulation, J. M. Kinsman, M. D., Louisville.
5. Clinical Progress in Obstetrics, Edward Speidel, M. D., Louisville.
6. Subject delayed, John J. Moran, M. D., Louisville.
7. Surgical Complications in Pneumonia, Wallace Frank, M. D., Louisville.

THURSDAY, 2 P. M.

1. Some Causes of Blindness, Claude T. Wolfe, M. D., Louisville.
2. Varicose Veins of the Broad Ligament as Cause of Pelvic Discomfort, Charles W. Hibbitt, M. D., Louisville.
3. Some Practical and Theoretical Points in Oxygen and Carbon Dioxide Therapy, W. Hamilton Long, M. D., Louisville.
4. The Ano-Rectal Abscess, Bernard Asman, M. D., Louisville.
5. Recent Developments in the Department of Psychiatry, W. E. Gardner, M. D., Louisville.
7. Prognosis of Para-nasal Sinus Disease, Walter Dean, M. D., Louisville.

**Prevention of Recurrence After Hernia Operations**—Bassini's method is, according to Adler, the most widely employed operation in the treatment of inguinal hernia. However, Bassini's original method as well as its modifications are followed by recurrence in from 4 to 5 per cent of the cases. To prevent recurrences the author perfected a new plastic procedure which provides reinforcement for the Bassini sutures.



THE TWELFTH ANNUAL MEETING OF THE EYE,  
EAR, NOSE AND THROAT SECTION OF THE  
KENTUCKY STATE MEDICAL ASSOCIA-  
TION, KENTUCKY HOTEL, MONDAY,  
MAY 16TH, 1932

EVENING SESSION, MONDAY, MAY 16

The opening session was called to order by the President, Dr. W. N. Offutt, of Lexington, at 7:00 o'clock p. m. with approximately fifty members present.

The guest of honor was Dr. William Thornwell Davis, of Washington, D. C.

An excellent dinner was served, after which the following addresses were presented: President's Address, Agranulocytic Angina, with report of Three Cases, W. N. Offutt, M. D., Lexington. This was followed by the address of our guest speaker, as follows: The Modern Conception and Treatment of Comitant Strabismus, William Thornwell Davis, M. D., Washington, D. C.

Dr. Adolph O. Pfingst, of Louisville, extended to all members present an invitation to join him at luncheon in the Kentucky Hotel at 12:45 P. M., Tuesday, May 17th, for the purpose of becoming better acquainted with the guest of honor, William Thornwell Davis, M. D., Washington, D. C.

The meeting adjourned at 9:45 P. M. to reconvene at 9:00 A. M., Tuesday, May 17th.

MORNING SESSION, TUESDAY, MAY 17TH

The Eye, Ear, Nose and Throat Section of the Kentucky Medical Association, was called to order in Parlor "A" Kentucky Hotel, Louisville, on Tuesday morning, May 17th, at 9:30 o'clock, by W. N. Offutt, M. D., President, with approximately thirty members present.

The Secretary, Dr. F. C. Thomas, Lexington, read the minutes of the eleventh annual meeting, in 1931, which, without objections or correction, were approved as read.

The Treasurer, Dr. S. B. Marks, Lexington, submitted the following report:

"Your Treasurer has only to report that the Section has on hand sufficient funds to defray all expenses of the present meeting, but that next year it will be necessary to charge the regular dues of three dollars."

Without objection the report was ordered received and made a part of the minutes. The next order of business was the election of new members, no names were proposed for membership.

Dr. E. C. Yates, Lexington, asked permission of the Section to withdraw motion made by him at previous meeting to the effect that the Section be abandoned. Dr. C.

T. Wolfe, Louisville, also requested permission to withdraw his second to the above motion.

Permission was granted by unanimous consent.

It was moved by Dr. S. B. Marks, Lexington, that election of officers be made a special order of business at the afternoon session immediately after lunch.

Motion duly seconded and carried.

There being no further business before the Section, the scientific program was proceeded with as follows:

Ophthalmic Tularemia; Report of Case, R. M. Armstrong, M. D., Lexington.

Discussion by Doctors Wm. Thornwell Davis, Washington, D. C.; R. H. Cowley, Berea; Claude T. Wolfe, Louisville; Geo. F. Doyle, Winchester; M. C. Baker, Louisville; and by Dr. Armstrong in closing.

Some Observations on the Treatment of Interstitial Keratitis, R. H. Cowley, M. D., Berea.

Discussion by Doctors Adolph O. Pfingst, Louisville; H. G. Reynolds, Paducah; S. G. Dabney, Louisville; Wm. P. Drake, Bowling Green; D. M. Griffith, Owensboro; Claude T. Wolfe, Louisville; Wm. Thornwell Davis, Washington, D. C.; and by Dr. Cowley in closing.

Catheterization versus Myringotomy in Purulent Otitis Media, J. D. Williams, M. D., Ashland.

Discussion opened by S. B. Marks, M. D., Lexington; also discussion by Doctors E. C. Yates, Lexington; A. L. Bass, Louisville; D. M. Griffith, Owensboro; Gaylord C. Hall, Louisville; Octavus Dulaney, Louisville; Walter Dean, Louisville; Wm. P. Drake, Bowling Green; and by Dr. Williams in closing.

Thermo-Puncture of Detached Retina. Walter Dean, M. D., Louisville.

Discussion by Doctors Adolph O. Pfingst, Louisville; and by Dr. Dean in closing.

Etiology of Middle Ear Suppuration With Special Reference to Sinusitis as a Factor; Report of Cases. A. L. Bass, M. D., Louisville.

Discussion by Doctors J. D. Williams, Ashland; S. C.; Dabney, Louisville; Gaylord C. Hall, Louisville; E. C. Yates, Lexington; S. B. Marks, Lexington; Walter Dean, Louisville; Octavus Dulaney, Louisville; and by Dr. Bass in closing.

Upon motion duly seconded and carried, the meeting adjourned to a luncheon in the Kentucky Hotel, given by Dr. Adolph O. Pfingst, Louisville for the purpose of enabling members of the Section to become better acquainted with the guest of honor, William Thornwell Davis, M. D., Washington,

D. C.; the meeting to reconvene at 1:30 P. M. on the same day.

#### AFTERNOON SESSION, TUESDAY, MAY 17

The Eye, Ear, Nose and Throat Section of the Kentucky State Medical Association reconvened in Parlor "A", of the Kentucky Hotel, at 1:30 P. M., and was called to order by the President, W. N. Offutt, M. D., Lexington.

The President announced that, pursuant to motion made and carried at the morning session, the election of officers to serve for the ensuing year was now in order, and called for nominations for President.

Dr. R. W. Bledsoe, Covington, placed in nomination the name of R. H. Cowley, M. D., Berea. Nomination seconded by Dr. Octavus Dulaney, Louisville.

Dr. S. G. Dabney, Louisville, placed in nomination the name of J. O. Carson, M. D., Bowling Green. Nomination seconded by Dr. Shelton Watkins, Louisville.

Motion was made, seconded and carried that the nominations be closed and the ballot spread.

The President appointed Dr. Walter Dean, Louisville, and Octavus Dulaney, Louisville, as tellers.

The ballot was spread and Dr. R. H. Cowley, Berea, having received a majority of all votes cast, was declared elected to the office of President to serve for the ensuing year.

Vice President: The President then called for nominations for the office of Vice-President.

Dr. J. D. Williams, Ashland, placed in nomination the name of Dr. S. B. Marks, Lexington; seconded.

It was moved by Dr. A. L. Bass, Louisville, that the nominations be closed and that the Secretary be instructed to cast one ballot for Dr. Marks for the office of Vice-President, to serve for the ensuing year. Motion seconded and unanimously carried.

The President then called for nominations for Secretary.

Dr. A. L. Bass, Louisville, placed in nomination the name of the present incumbent, Dr. F. C. Thomas, Lexington.

Upon motion by Dr. J. D. Williams, Ashland, seconded and unanimously carried, the nominations were closed and one ballot was cast for Dr. Thomas for the office of Secretary, to serve for the ensuing year.

The President then called for nominations for Treasurer.

Dr. A. L. Bass, Louisville, placed in nomination the name of Dr. Walter Dean, Louisville. Upon motion duly seconded and carried, the nominations were closed and Dr. Walter Dean was unanimously elected Treasurer, to serve for the ensuing year.

#### REPORT OF SECRETARY

The Secretary, Dr. F. C. Thomas, Lexington, reported that there are now sixty-eight members of the Section in good standing, and urged the necessity of the acquisition of new members, calling attention to the fact that it requires the nomination by one member, seconded by another member, to propose a new name for membership.

Dr. H. G. Reynolds, Paducah, extended to the Section a cordial invitation to hold its next annual meeting in Paducah, Ky.

It was moved and seconded that the time and place of the next annual meeting be left to the discretion of the officers. Motion unanimously carried.

There being no further business before the Section, the scientific program was continued as follows:

Clinical Aspects of Tumors of the Jaw and Palate; (Illustrated by lantern slides) E. C. Yates, M. D., Lexington Clinic, Lexington.

Discussion opened by Claude T. Wolfe, M. D., Louisville; also discussion by Wm. P. Drake, Bowling Green; R. W. Bledsoe, Covington; A. L. Bass, Louisville, and by Dr. Yates in closing.

Local Temperature Studies in Diseases of the Ear, Nose and Throat, (Illustrated by lantern slides). Karl N. Victor, M. D., Louisville.

Discussion opened by Walter Dean, M. D., Louisville; also discussion by Doctors S. B. Marks, Lexington; H. G. Reynolds, Paducah; Octavus Dulaney, Louisville; R. W. Bledsoe, Covington; and by Dr. Victor in closing.

On the Prevalence of Morax-Axenfeld Conjunctivitis, Gaylord C. Hall, M. D., Louisville.

Discussion by Wm. Thornwell Davis, M. D., Washington, D. C.; H. G. Reynolds, M. D., Paducah; and by Dr. Hall in closing.

Upon motion, duly seconded and carried, the Section adjourned to meet sine die.

F. C. THOMAS, M. D.

Secretary.

**"Avertin" in Gynecology.**—Young believes that, employed in a dosage which does not exceed 0.1 Gm. per kilogram of body weight, "avertin" is a safe drug. In this dosage it may suffice for minor operative work, but a supplementary inhalation anesthesia is usually required. Its advantages are: (1) ease, comfort and certainty of induction; (2) reduction of postoperative discomfort and sickness, and (3) reduction of postoperative pulmonary complications. In the author's series of 1,000 unselected cases there were no deleterious effects, either immediate or remote. There were five deaths in the series, and in no instance could the fatal issue be attributed to the "avertin."



## ORIGINAL ARTICLES

## AGRANULOCYTIC ANGINA AND REPORTS OF THREE CASES\*

W. N. OFFUTT, M. D., F. A. C. S.

Lexington.

This disease was first brought to our attention in 1922 by Schultz and Rye of Germany, who gave it the name of Agranulocytic Angina. They believed it to be a true clinical entity, though there are many who believe it merely a syndrome. It is thought to be more prevalent in women of middle life, brought on by some endocrine disturbance or imbalance at that time.

The symptoms of Agranulocytic Angina are (1) An acute systemic infection with high fever, (2) Rapid diminution of the white cell count and still more rapid loss in the polymorphonuclear cells which are some times completely absent, (3) Ulceration and necrotic lesions of the oropharynx, especially on the tonsils, gums, pillars and tongue. The clinical picture of the throat lesions looks very much like a dirty diphtheritic exudate on a dark or black necrotic base, usually found on the tonsils, yet may be found on the gums or hard palate.

The chief symptom of this gangrenous process is the terrible necrotic disintegration of tissue. The leucocytic reaction so commonly present in nearly all inflammatory conditions is absent.

These lesions begin as white or gray areas, turning to a dirty gray, then to a blackish gray on a necrotic gangrenous base, with a very offensive odor. This odor is almost diagnostic. Mild jaundice is reported in about fifty per cent of these cases. The disease is self-limited to the mucous membrane, destroying it down to the muscle, but never going beyond. The gums and palate tissue being destroyed down to the bone.

Bacteriologically the question is still unsolved, but since the bacillus pyocyaneus is found in nearly all cases, it is thought to be one of the causative organisms, together with some anaerobic organism. Many other organisms have been found in the lesions such as streptococci, staphylococci, diphtheria and Vincents spirillae. All of the last named are thought to be simply coincidental, as they are not found with any degree of regularity.

Clinical symptoms aside from the lesions of the throat, mouth, temperature and blood are of little value.

There seems little to be learned from autopsy. The liver, spleen, kidneys undergo little change other than slight enlargement.

The blood picture tells the whole story, and it is upon it we make our diagnosis. The moderate to severe leucopenia, the leucocytes going down to a few hundred, and the polymorphonuclear leucocytes very low, and sometimes absent altogether. The hemoglobin remains about normal in the first stages of the disease, though a few cases of secondary anemia have been found in late stages. The lymphocytes are nearly always increased, sometimes as much as 100%.

The platelet count is usually about normal, the bleeding and coagulation times are normal, yet some cases have been reported with hemorrhagic tendency. There are certain chemical or physical agents such as the arsenicals, benzol, thorium, x-rays and radium that have produced a similar blood picture. Roberts and Kracke state that the red marrow of the bones makes erythrocytes, granular leukocytes, and platelets.

In agranulocytic angina the factory that makes the granulocytes has shut down. The life of this cell in normal conditions of health is three or four days. Therefore, should the red marrow stop manufacturing them for three, four or five days they would after a time totally disappear from the blood stream. This is what undoubtedly happens in these cases. The factory divisions of the marrow that makes the erythrocytes and platelet seem to continue to work at approximately their normal output. There is little if any evidence that granulocytes are found normally in the marrow and destroyed in the blood stream. On the contrary, there is much evidence that the myelocytic function of the marrow stops, and that the primary pathological condition is in the bone marrow.

It is conceded now that the marrow and blood stream changes precede the clinical manifestations. There have been several cases reported, where the mouth and throat may be normal and the lesion was in the rectum or vagina.

When there is an absence or decrease in the polymorphonuclear leukocytes a patient's immunity is destroyed and any bacteria in any part of the body may become active and produce a septic condition.

In reviewing the literature on agranulocytic angina it would seem that there must be two types of this fearful disease, a true type that ever recovers, and a pseudo type that responds to transfusions of whole blood and apparently recovers only to succumb to a subsequent attack.

I will briefly report three cases that came under our observation. All of them, women of middle life.

Case 1. Mrs. G. H., 36 years of age, past history good. I was called to see her at her home (March 2nd, 1928), complaining of

\*Read before the Eye, Ear, Nose and Throat Section of the Kentucky State Medical Association.

what she thought was a severe case of tonsillitis of two or three days duration. Temperature was 101  $\frac{3}{5}$ , pulse 118, respiration 22.

Throat examination showed a dirty diphtheritic looking membrane on both tonsils and I was so positive it was diphtheria that she was given 20,000 units of anti-toxin before I heard from the culture as she looked profoundly toxic. I was still confident it was diphtheria even though the first culture was reported negative, but the second and third culture showed nothing but staphylococci and streptococci. Red blood cells 4,320,000. Leucocytes 5,850, polymorphonuclear 8.4%. Patient refused to be moved to the hospital. On March 4th, temperature was 103. Pulse 22, leucocytes 2,800. The lesions on the tonsils were about the same, but the membrane had spread to the mucous membrane of the jaw on the right side. She complained of generalized aching over whole body, no swelling of the glands of the neck. March 6th, temperature was 102, pulse 24, leucocytes 1900, polys. 0. Patient looked profoundly septic, sleeping most of the time, but could be easily aroused and was perfectly rational when awake and complained of exhaustion. The throat symptoms were about the same mentioned above with the exception of a necrotic spot on the oropharynx on the left side. Died that evening. Unable to get autopsy.

Case 2. Mrs. D., aged 38. Was called in consultation to see this case the morning before she died. So will report it from the notes made by Dr. Hunt, who had charge of the case from the beginning. He saw her first, January 3rd, complaining of sore throat, no membrane, cervical glands somewhat enlarged, said she felt sick and had not felt well for several days, temperature 102, little change in patient's temperature and condition for the next two days. On January 8th patient said that she had a good night sleep and felt she was well. Temperature was 99. At six-thirty that evening she had a chill and temperature went to 103, with a quick irregular pulse. I saw her the next morning and on examination of her throat found a small spot of grayish looking membrane at the base of the right tonsil and no inflammation anywhere else in the throat. She did not complain of any pain or discomfort except a feeling of complete exhaustion. Blood examination showed leucocytes 145. Polymorphonuclear cells none. She died about eleven o'clock that night. Autopsy refused.

Case 3. Miss S. Age 54, first seen January 24th, 1929. Complaining of headache and sore throat. Gave history of having had light attack of influenza about ten days before, but had been feeling much better and had

been out to a luncheon that day with some friends. Her temperature was 102. Pulse 122. Examination of her throat showed small grayish patch on her left tonsil, no redness or inflammation anywhere else in her throat. Culture taken showed preponderance of staphs and a few streps. Did not see patient again until the following night at which time temperature was 103, pulse 126. Said throat felt better, but headache and pains in arms and shoulders were worse. Examination of throat showed little or no change, there was some slight swelling of left submaxillary gland. Was not alarmed over her condition, as up to this time she did not look very sick and talked about things she expected to do in a few days. The next day, January 26th, her nurse called saying she was much worse, had a chill and temperature had gone to 104. I was struck by marked change in her general appearance, complaining of extreme exhaustion and intense soreness of all muscles of her body. Her family physician was called in consultation and she was sent to the hospital. The blood report showed, red blood corpuscles 4,920,000. Hemoglobin 70%. Leucocytes 725. Polymorphonuclears 0. Culture from the throat, staphs, streps, diplococci and fusiform bacilli. Diagnosis made of Agranulocytic Angina. X-Ray treatment over the long bones in the hope of stimulating activity in the bone marrow was to no avail. January 27th, patient's temperature, 104  $\frac{3}{5}$ . Pulse 120, respiration 28, leucocytes 240. Polymorphonuclears 0. Marked swelling on both sides of the neck. Patient died that evening. Autopsy obtained. Histo-pathological report as follows: Necrosis of the epithelium of esophagus. Fibrinous vegetative endocarditis involving all the valves of the heart. Extensive granular degeneration of the liver. Granular degeneration of the parenchyma of the kidney. Marked exhaustion of the bone marrow from tibia. Cultures from the blood produced a heavy growth of streptococcus hemolyticus. In conclusion, I wish to say that everything was done for these cases possible with the exception of transfusions.

They had repeated consultations of the best medical talent in the city, but nothing suggested seemed to be of any benefit. In one case the Rockefeller Institute in New York was called up to see if they could give us any help and their reply was they had found nothing that had given any relief.

The most puzzling case, the one that had practically no throat symptoms, yet undoubtedly was Agranulocytic Angina, as her white cell count was only 145 and no polymorphonuclear cells.

All of these cases had been on more or less strict diet for a period of over two years,



cutting out all starches and fats from their food and had reduced their original weight by fifteen or twenty per cent. Whether this could have been a factor in lowering their powers of resistance I cannot say.

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## THE MODERN CONCEPTION AND TREATMENT OF COMITANT STRABISMUS\*

WM. THORNWALL DAVIS, M. D.

Washington, D. C.

The conception of squint and the treatment thereof are distinctly advanced over that of a decade ago. In the following remarks attention will be invited to comitant convergent squint in young children.

We do not fully understand the causes of convergent squint. The following are the accepted theories:

1. Hypermetropia.
2. Anisometropia.
3. Reduced visual acuity in one eye over the other.
4. Weak or absent fusion sense.
5. Hereditary influence.

Hypermetropia predisposes to convergent squint by disturbing the accommodation-convergence relation. For each dioptré of accommodation one metre angle of convergence is used. The disturbed relation of these two functions in the presence of other factors is a contributing cause. Accommodation and convergence are actuated by the same nervous impulse; there is a certain degree of dissociation or latitude in these two functions varying with the individual. Hence one may be hypermetropic with no squint provided other factors do not supervene; conversely one may be myopic and have a convergent squint.

Undoubtedly in some cases anomalous insertion of muscles, a strong median rectus, a weak lateral rectus or a combination of these may be a cause of squint, particularly when coupled with hypermetropia and poor fusion ability.

Esophoria of muscular origin may originate the squint. Since esophoria and convergent squint occur in emmetropes and myopes, it is obvious that hypermetropia and the consequent disturbed relation of accommodation and convergence is not the cause of all squints.

It is thought by some that a muscular or

anatomic anomaly is the primary cause of squint and that, faulty fusion and central scotoma result. By others it is thought the weak fusion sense and central scotoma precede and cause the squint. Hence it is a question if the poor fusion sense is a cause or a result of the squint.

Since we have examined candidates for airplane pilot licenses we have discovered many who have insufficient depth perception, stereoscopic vision or sense of perspective. This means weak fusion. If the individual having this weak fusion also has an esophoria, muscular anomaly or if he is hypermetropic and cannot dissociate accommodation and convergence he will probably develop a squint.

Fusion may be defined as the power of converting two retinal images into a single mental picture. Muscular adjustment could not possibly be so fine as to superimpose two retinal images to form a stereo-picture. Hence it is obvious that the brain must do this: fusion is a brain function. There is a theoretical fusion center; it has not been demonstrated. The nature of the coordination of the eye muscles and the intricate movements connected with their complex functions is but illy understood.

"The eyes are the brain coming out to see;" this is literally true embryologically. Vision is the most important of the special senses; the visual apparatus occupies a considerable portion of the brain. The sensorimotor impulses comprising the stereo-mental picture, depth perception, etc., is perhaps the most complicated cerebral function. Is there a motor control center for the very delicate adjustment or is it dependent upon association centers? Fusion is developed in the child about the sixth month. If it be weak or absent the desire for binocular single vision is weak or absent and squint may result. Upon this presumption of poor fusion sense the fusion training is based.

It is said by some that true fusion of the retinal images does not exist, else there would be no stereoscopic vision. We speak of superimposition of the images as fusion; since however the object is seen from a different angle by each eye, the images are not exactly superimposed. As actual fusion does not occur, how can we then assume there is a fusion center? We have more reason to think there is a convergence center since convergence paralysis is known. No such center has however been demonstrated.

The essence of strabismus according to Parinaud is first excess innervation of convergence and later changes in the periocular tissues. The excess innervation disappears at about twenty years of age, but the deviation persists, being maintained by the peri-

\*Read before the Eye, Ear, Nose and Throat Section of the Kentucky State Medical Association.

ocular tissues, the orbital fascia in particular. Hence the fault of innervation has become the cause of the continuing squint. As the individual grows older this excess innervation tends to disappear, but not so the organic changes.

Parinaud thinks squint results from a faulty development of both the motor and sensory portions of binocular vision. The motor portion is the convergence and its relation to accommodation. The sensory portion is the reflex of convergence and accommodation.

Anisometropia and reduced acuity of vision in one eye or a disproportion of visual acuity predisposes to squint. If the other factors mentioned be present, viz: weak fusion, esophoria or hypermetropia there will be a convergent squint.

The onset of the squint from an injury or illness is frequently mentioned by the mother. It is obvious upon reflection that such shocks would not produce a squint if the predisposing causes were not present.

There are other theories which seek to account for squint; the declination theory of Stevens; emotional instability; or that it is a stigma of degeneration. We are not sure as yet of the exact cause, this is obvious from the many theories advanced, none of which are entirely acceptable.

Hereditary influence plays an important role. This is common knowledge.

The treatment of squint may be divided into four periods.

1. Occlusion and atropinization of the fixing eye.
2. Refraction.
3. Fusion training.
4. Operation.

The importance of early treatment should be stressed: the school teacher, the general medical profession, the pediatrician in particular, nurses and parents and the general public should be informed that only early treatment can be fully successful. To neglect a squinting eye even for a few weeks after the inception of the squint is to invite amblyopia in this eye and make a perfect cure difficult or impossible. A child with an untreated crossed eye is a neglected child. Too much emphasis cannot be placed upon the necessity for immediate treatment once a squint is noted, even though the child be but an infant. Occlusion of the fixing eye should be done at once in order to prevent amblyopia. After seven years of age, it is agreed by all that perfect cure of the squint and restoration of vision in the amblyopic eye is impossible.

By cure of the squint I mean straight eyes without glasses. Of course glasses may be necessary for correction of astigmatism or

other refractive errors causing asthenopia. By the term "without glasses" reference is made solely to correction of the squint.

It is obvious, but not always realized, how important is the general health of the child in connection with treatment of squint. The refraction, occlusion and orthoptic training is trying upon the child and the mother and sustained effort is necessary. In order to accomplish this training the child must be in good health. Careful and intelligent attention should be given to this phase of the case. It is essential. To be successful the four steps of the treatment of squint must be carried out with diligence and intelligence. Understanding of the child is necessary and equally important.

It is important that the surgeon should have a concise plan, clearly understood by himself, and carry out this plan with energy and determination. Treatment should not be insufficiently interested or unintelligent or noncooperative; if the child is of insufficient mentality to carry out his part of the treatment; or if the family is a disorganized one, we can scarcely expect to accomplish much and should proceed as promptly as possible to step 4, i. e., operation.

The devastating effect of the squint upon the future of the child should be understood. Our civilization is hard upon the young; the schools demand more from them than they should. Their physical education is often neglected. They have too long days and too long hours of application. Frequently there is improper or insufficient food. The general lack of the knowledge of proper living reacts harshly upon the immature tissues and nervous organization of the child.

If there be superimposed upon this a convergent strabismus the child will suffer under the added strain. The mental effect of the squint upon him is bad: he is cruelly teased by his school mates until his life, which should be all laughter and care free joy, becomes a daily horror. Children do not speak of these things; like all of us, the deeper the hurt the less we speak of it. The parents frequently do not realize the agony the child is suffering. The result is far reaching; it is naturally worse in the intelligent child of the cultured class.

The inferiority complex is induced, the child may become more or less asocial and infinite harm is done to his plastic and growing mind, from which he never entirely recovers. The wearing of glasses by the school child still further subjects him to the cruel taunting of his mates. It also adds a burden a handicap in his play and renders his small life more difficult. The wearing of glasses by a school child is a sore trial to him and to the mother and should be avoided if possible.



Upon consideration of the above facts it is apparent that if a cure of the squint can be accomplished in the preschool age, it should be done. I am sure some of the medical profession do not yet realize perhaps this evolution in the treatment of squint. It should be realized that it is possible to cure convergent squint in the preschool age and so relieve the child of a most serious handicap at the very beginning of his life. Not to do this is to show ourselves without the proper understanding of this recent and important development in the art of ophthalmology.

Please do not understand me to say glasses are unnecessary in the treatment of squint, refractive errors or muscle imbalance. My contention is that they should be avoided in the school child for the treatment of squint when it is possible to do so.

As soon as the examination of the child is completed the surgeon should outline the treatment and steps thereof to the parents. Unless they understand this outline of treatment and just what we are seeking to accomplish we cannot get the necessary co-operation. It encourages the parents of these children if one assures them of the ultimate cure of the squint *within a reasonable time*. It is my firm belief, based upon approximately 300 operative cases, that almost one hundred per cent can be cured in the preschool age.

The occlusion of the fixing eye may be done in various ways. The best and least annoying to the child is the occlusion shield of hard rubber, secured to the frame of the glasses. Some surgeons occlude continuously for some weeks; others prefer a certain number of hours a day. Care should be used not to induce amblyopia in the sound eye by prolonged occlusion. The occlusion treatment for more than a few months is impractical.

The refraction of course is done under the cycloplegic effect of atropin. One should bear in mind that the hypermetropia becomes less as the child grows and consequently refraction at the end of a year is indicated. Also the accurate refraction of a young child is difficult. It may be done more accurately at the end of a year.

A powerful argument of early operation and cure of the squint is to enable the child to omit the wearing of glasses. Under the old system of treatment of squint, strong glasses were prescribed and kept on until the child reached physical maturity. In consequence this individual was condemned to glasses for the remainder of his life. After wearing strong hypermetropic correction during childhood and adolescence the accommodation is weakened and the individual cannot see with comfort or distinctness for

distance or near without glasses. These patients frequently have voluntary accommodation so that upon removing their glasses and with the accommodation relaxed the squint is absent, but they see very indistinctly. When they wish to see clearly they voluntarily use the accommodation, the squint recurs and they see clearly; the clear vision and the squint occur at the same time and cannot be dissociated. Likewise the clear vision occurs only during the time the patient is *consciously* using the accommodation; the moment his attention is withdrawn the accommodation relaxes, visual acuity is reduced and the squint disappears; this results from the continued use of the full or nearly full hypermetropic correction. It is preventable. The patient with such a condition is scarcely amenable to operation and cure of his squint. I do not consider a child with a squint cured who has straight eyes only while wearing glasses.

In certain cases in adults as described above if they have the unusual fortitude, courage and tenacity of purpose to carry out accommodative and orthoptic exercises, one may offer them a possibility of cure. In some cases of this nature after operating the eyes are straight during accommodation, but may diverge when it is relaxed either consciously or with glasses. Thus it becomes obvious that energetic early treatment is essential before such paresis or weakening of the accommodation becomes a set habit.

The age at which one may begin the orthoptic exercises depends upon the development of the mentality of the child and the home conditions. This form of treatment is necessary and essential but should not be relied upon to cure the squint. It should be begun as soon as possible and carried out with energy and tact. If these steps are successful within a year well and good, but should the squint not be cured within this period it then becomes necessary to proceed to the fourth and last step, viz: operation.

If the squint is of such high degree that it is not possible to use the amblyoscope or stereoscope, immediate operation is indicated. After this orthoptic exercises may be necessary to complete the cure.

The choice of operation lies with the surgeon. In my opinion the Jameson recession operation is efficient and safe in experienced hands. It has certain advantages over other operations. It can be performed on children at two and one half years of age with perfect safety. It is done in children, of course, under general anesthesia.

Approximately  $2\frac{1}{2}$  degrees (of arc) correction may be anticipated for each mm. of recession. The number of mm. of recession must be predetermined by the sur-

geon after careful measurement of the degree of squint for distance and near, with and without correcting glasses. We thus enter upon the operation with a clear conception of what is to be done. It may be good judgment to modify the determined mm. of recession upon inspecting the muscle and its primary and secondary attachments.

The operation is surgically superior in that trauma is minimized; the muscle coverings, capsule, blood and nervous supply are not interfered with. There is no tension upon the sutures and recovery is prompt. These attributes of the operation are of great value and importance both surgically and functionally.

The one step of the operation, the insertion of the scleral sutures, that requires nice care, offers no difficulties in the hands of the surgeon with the requisite surgical technique. It is neither difficult nor dangerous. It is essential that the proper instruments be used and in particular the special needle of Jameson for the scleral suture. The operation is in effect a guarded and exact tenotomy; this is something for which we have sought a long time. In reality the muscle is detached from the globe without modifying its anatomical relations. The globe is then placed in proper position and the muscle reattached. Hence the extremely slight reaction.

Should over correction occur it may be easily remedied since the position of the muscle is accurately known and there has been so little trauma and scar tissue formation that it becomes an easy matter to alter its position.

Recession of the muscle should not be more than 5 mm. since convergence might be weakened. In higher degrees of squint, double recession may be safely performed in one sitting. The reaction from the Jameson operation is surprisingly slight.

Before operating the family should be informed that more than one sitting may be required. This is important.

The routine followed in my clinic is as follows:

The patient is admitted to the hospital Monday evening. Operations begin at 8:30 Tuesday morning using avertin as a basal anesthetic with gas and oxygen following, together with local anesthesia of the eye to be operated upon. Thus there is no fright or shock to the little patient. Both eyes are bandaged for twenty-four hours. On Wednesday morning the sound eye is left open and the child returns home and goes to school the following Monday.

Following operation there is moderate redness at the inner canthus without edema or swelling and in ten days the eye is entirely

white with no bunching of the tissues and the child has forgotten that an operation was done.

I am not aware of any other operation with so little reaction, interference with the activities of the child or unpleasant sequelae.

Gut is used since there is no tension, hence there are no sutures to be removed. This avoids a most trying ordeal for the child, the mother and the surgeon.

I can imagine no modification that would be an advantage to this operation. Masterful in conception, its simplicity, safety and accuracy, due to adherence to sound surgical principles, and the almost complete absence of reaction render it at once ideal for the surgeon and the patient. To attempt modification by making it more complicated is unnecessary.

To summarize:

The treatment of crossed eyes today is a great improvement over that of a decade ago. The etiology remains in doubt. The convergence-accommodation coordination plus hypermetropia plus a weak fusion ability probably accounts for most of the cases. Excess innervation of convergence during the developmental period may be a factor.

There are four steps in the treatment:

1. Occlusion and atropinization of the fixing eye.

This should be carried out immediately upon recognition of the squint to prevent amblyopia of the squinting eye. Amblyopia of the squinting eye will take place within a few weeks following the inception of the squint, it is difficult and in many cases impossible to cure.

2. Refraction.

This should be done under the cycloplegic effect of atropin and slightly less than the full hypermetropic correction given. It should be done as soon as the child is walking about.

3. Fusion training.

This is accomplished with the amblyoscope or stereoscope as soon as the mental development permits. Its use requires stability, intelligence, interest and patience upon the part of the surgeon, the mother and the child. It is helpful but certainly not curative in the majority of cases in this country. From Claud Worth's reports it is more helpful in England than here. It may be started before operation provided the squint is not of too high degree. If of high degree, operation should first be done followed by the exercises. Orthoptic exercises can only be carried out for a certain period because of loss of interest on the part of the child and others. If the preceding named measures do not cure the squint within six months or one year, and the child has reached the age of two and one-half years, operation is indicated.



#### 4. Operation.

This should be done early so that the squint may be cured in the preschool age. This is the great step forward in this branch of ophthalmology of recent years.

The Jameson recession lends itself to operations for squint in young children particularly well. There is but one day of hospitalization required; the reaction is practically nil; there is no post operative deformity even temporarily; there is no danger. It admits of accurate adjustment of the squinting eye under general anesthesia. The child can be back at play or school in 48 hours.

It is recommended to those who have not familiarized themselves with the technique of the operation to do so since it has points of superiority not surpassed and in my opinion not equalled by any other surgical procedure for the cure of convergent squint in children.

In the writer's opinion crossed eyes are not considered cured unless the eyes are straight without correcting glasses and when the child is accommodating, i. e., seeing clearly for both distance and near. This is a severe test.

The result of a squint and the wearing of glasses by a school child is bad. The physical deformity invites comments from his associates which are not conducive to the child's peace of mind: this leads to quarrels, fights and finally to the withdrawal of the child from sport and play. He becomes sensitive, lonely and morbid. His parents may not be aware of this and often are the last to know of it.

The wearing of glasses by the school child is a great handicap and should not be demanded of him if there is a way to avoid it. The result of an uncured squint may be a psychosis which is deep and may not be discovered until late in life. It can never be cured—it may easily be prevented.

**Endocrine Therapy**—Vincent summarizes the scope and limitations of endocrine therapy thus: The cases in which it is possible to employ a true endocrine therapy—artificially to take the place of the internal secretion of a gland—are those of the thyroid, parathyroid, pancreas (insulin) ovary, suprarenal cortex, suprarenal medulla, and the two parts of the pituitary. Of these, only one, the thyroid, is known to produce any effects when given by the mouth. The others must be administered by some other route. Epinephrine and preparations of posterior pituitary are chiefly used as drugs apart altogether from the question of internal secretion and substitution therapy. The anterior lobe of the pituitary, though it produces marked effects on growths when injected into animals, has not yet been demonstrated to be of service in the treatment of disease in the human subject.

#### SOME OBSERVATIONS ON THE TREATMENT OF INTERSTITIAL KERATITIS\*

R. H. COWLEY, M. D.

Berea.

This brief paper is based on the observation of a few cases of interstitial keratitis and on the review of a large number of articles which have appeared in the medical literature of the last few years and which were obtained from the package library of the A. M. A. and from the Tice Loose Leaf Medicine service. I noticed as I read these articles that in many of them the positiveness of the statements were in direct proportion to the scarcity of the material on which the statements were based.

In the second American edition of Fuchs Text Book of Ophthalmology printed in 1905 occur these words, "Interstitial keratitis in many cases, even under the most careful treatment runs a course that is not essentially different from what would have been the case without any treatment; not infrequently we see the disease while under treatment break out in the other eye, without our being able to prevent the opacity from spreading over the entire cornea of that eye also." Many of the best men in this country at the present time, if one may judge from these recent articles and the discussions of them, take practically the same view as did Fuchs 25 years ago despite the great improvement in the treatment of syphilis which the arsenicals, bismuth and other modern drugs have brought to us during this time. Downing of Des Moines says, "Where most was to be expected of it Arspenamine has singularly failed, namely in interstitial keratitis. In a large percentage of the cases where it was used the second eye has become involved, hence it does not seem to have even a prophylactic effect."

Clapp of Baltimore in summing up the recent literature says, "In reference to the treatment there seems to be sufficient material for the belief that in some cases the preparations of bismuth may be better than those of mercury, and that the local treatment of the cornea by the Roentgen rays in the early stages has resulted in sufficient improvement to warrant further trial. It is questionable whether the use of malarial inoculations have shown enough evidence of improvement in the results to justify the dangers involved." In the body of his paper he mentions the fact that Marchiesani has used typhoid vaccine and that Huber used both typhoid vaccine and milk injections with

\*Read before the Eye, Ear, Nose and Throat Section of the Kentucky State Medical Association.

good results but he did not consider this of enough importance to include it in his summary. Geo. W. Mackenzie of Philadelphia speaks of focal infections as an infrequent cause. He says that when due to syphilis it is practically always bilateral whereas when due to focal infection it is generally unilateral. He reports cases where the thorough cleaning out of a dental abscess produced immediate cure.

DeCourcy and Mather in the British Medical Journal report the technique of the x-ray treatment and report a number of cases where they got immediate and permanent results by it use.

Really the most striking results that I found in all my reading. Wright and Perlman give a fine review of their experience with bismuth therapy at the University of Pennsylvania Medical School and their conclusion is, "From our studies, we believe that the best treatment for interstitial keratitis consists in the conjoint use of sulpharsphenamine and bismuth or the intravenous use of neoarsphenamine followed by intramuscular injection of bismuth alternately or else immediately following a course of one by a course of the other. We believe that bismuth, by all means, is an important weapon in the therapeutic armamentarium against congenital syphilis."

Carvill and Derby reviewed the material supplied by 186,000 eye cases passing through the Massachusetts Eye and Ear Infirmary in ten years. They found 756 cases of interstitial keratitis or an incidence of less than one-half of one per cent. They selected 100 untreated or poorly treated cases and compared with these 100 intensively treated cases. Their paper is a classic and they take a rather optimistic view but the best they can say in their summary is, "These figures would seem to suggest that intensive anti-syphilitic treatment exerts some influence in the prevention of the involvement of the second eye and perhaps makes the attack less severe in some cases." So far as I have been able to find this paper by Carvill and Derby is the only attempt that has been made to compare a large number of untreated cases with the same number of intensively treated cases and surely their conclusion does not justify us in feeling very happy about the improvement in the treatment of interstitial keratitis during the last 25 years.

It is quite evident that one situated as I am would be foolish to draw conclusions from results which he may have obtained from the few cases at his command. However, it is quite as evident that he is justified in considering the present treatment of interstitial keratitis as uncertain and unsatisfactory and in doing some speculating on his own when

confronted with a case. So I have done a little philosophizing about the situation and wish to present the following observations merely as food for thought. First, if as most of our best men agree, interstitial keratitis is due to congenital syphilis, then it should yield to antisymphilitic treatment as other syphilitic lesions do. It seems to be pretty generally agreed that this is not the case.

Second, so far as I can find, there is no definite proof that the spirochete of syphilis is present in the corneal tissue in interstitial keratitis. In by no means all cases can the presence of syphilis be proven either in the child or in the parents. Fuchs again says, "In many cases no cause at all that we can be sure of is discoverable to account for the eye disease," and Lowenstein in a recent article expresses the opinion that the cellular infiltration which he always found about the ciliary vessels and not the spirochetes, by causing interstitial changes, produced the keratitis.

Third, Conditions closely simulating interstitial keratitis are known to be caused by tuberculosis, focal infections and other debilitating diseases where syphilis can be practically ruled out. I think it is Mackenzie who says that syphilis causes about 90% of the cases while the other 10% are caused by tuberculosis and other diseases.

Fourth, Many devastating diseases such as tuberculosis, trachoma, pellagra, beriberi and the like do not ravage the human system unless the soil is prepared for them by the lack of the essentials of healthful living. In other words the individual can resist these diseases if his food and living conditions are what they should be.

Fifth, Hereditary syphilis causes the death of many children before they are born and of many more in early infancy. Those who do survive are very apt to be reduced in vitality, subject to all sorts of degenerative diseases, and would most likely be an easy mark for such a disease as interstitial keratitis even if it were not specific. Consider for instance Hutchinson's teeth.

Sixth, Interstitial keratitis is not a distinct isolated entity but is part of a general eye condition where all the coats of the eye are more or less affected.

The iritis accompanying it does not differ in any essential from that seen following focal infections.

With these cogitations in the back of my head I was confronted a few years ago with a case of interstitial keratitis. I gave it the conventional antisymphilitic treatment over a long period with exactly no result. At last I communed with myself somewhat as follows. Now if I didn't know that there was such a thing as interstitial keratitis and if



I didn't know that there was such a thing as syphilis I would think that I was confronted with a case of iritis with clouding of the cornea and would treat it as I would any case of iritis. At about that time I was getting pretty keen about the use of milk injections in all sorts of inflammatory eye conditions and so I tried milk injections. To my surprise and delight the eye began almost at once to clear up and it improved steadily and rapidly to complete recovery. Since then I have had a number of similar cases where the antisyphilitic treatment has failed and where the foreign proteid, I now use omnadin, has brought prompt and rather rapid results.

I wish to report one case which illustrates this point and which is possibly an example of the so-called Herxheimer reaction. During the medical examinations in our public school Dr. Coleman, our county health officer, noticed a boy with indented incisor teeth. They were not typical Hutchinson's teeth, but he suggested that the parents have a Wassermann test made. Father and mother both showed a plus 4 Wassermann and Kahn. Examination was made for other evidences of syphilis in the family but none were found. There had been no miscarriages and all were apparently healthy. However it was thought best to give the whole family treatment. The parents were given .6 grams of neosalvarsan for six doses. The children being young were given .15 grams for six doses. After the sixth dose was given, one of the boys, aged 9, suddenly, developed a marked interstitial keratitis in his left eye. The cornea in a few days became opaque so that the pupil could scarcely be seen. Deep circum corneal injection with photophobia were present. I immediately increased the dose to .45 and as this caused no reaction the next dose and the five following were increased to .6. There was no improvement in the eye condition. I then started giving omnadin giving one ampoul a day for three days waiting three days and then giving three more injections. The eye began to clear up from the very first dose of the omnadin and after the sixth dose was well on the way to recovery. It had steadily improved since, till it is now well.

Two questions may be asked, First, did the small doses of the neosalvarsan have a provocative effect producing the so-called Herxheimer reaction. Second, Why did the case clear up under omnadin when it had resisted neosalvarsan if it was really of syphilitic origin which seemed to be the case.

Conclusions. Interstitial keratitis is not a disease but a symptom which has as its underlying cause many different conditions. Syphilis is the most common cause but in the absence of evidence of its presence we should not blindly flood the patient with anti-

syphilitic drugs but should study the case for the cause of this symptom just as we would study it for the cause of headache or belly ache. In the absence of a demonstrable cause, we should not neglect the use of tuberculin, and foreign proteid nor should we neglect to hunt for a focal infection. Lastly if we have the proper equipment we should not neglect to use the x-ray.

#### DISCUSSION

**Adolph O. Pfingst, Louisville:** We are discussing an interesting and obscure disease. This is indicated even in its nomenclature. While I am not familiar with the latest classification of the pathology in inflammations occurring in the kidneys, presumably the terms interstitial and parenchymatous as applied to nephritis indicate diametrically opposite conditions, whereas, in corneal inflammation we use the terms synonymously.

The outcome of interstitial keratitis as to ocular function has always been rather discouraging for it has been estimated that only about half of the eyes affected with the disease, regain normal or useful vision, that 24 per cent of the cases recover only enough vision to do very primitive work, whereas, 5 per cent of the cases find their way to blind schools. The cause of blindness in these cases is evidently an involvement of the uveal tract and not the diseased cornea.

In order to obtain a comprehensive idea of the cause of the frequent disturbance of vision following interstitial keratitis, we must follow the changes that take place in the substantia propria of the cornea, where the pathology occurs. The large stellate corneal corpuscles occupying the corneal spaces swell and often disintegrate, also the walls of the cavity, thus enlarging it and sometimes causing fusion of one or more of the spaces. Coincidentally with these change a rapid infiltration of leucocytes occurs, filling the spaces and the connecting canaliculi and finally blood penetrates the diseased area from the periphery of the cornea. It is evident that after such changes have taken place a permanent cloud must remain in the cornea and that such can only be avoided by early recovery prior to vascularization.

We have learned from the essayist that a large majority of cases of interstitial keratitis have been attributed to lues. Foster Moore says that there is but one cause for the disease. However, the consensus of opinion is that congenital syphilis accounts for from 80 to 90 per cent of the cases, acquired syphilis, perhaps 2 or 3 per cent and tuberculosis most of the other cases. With these figures in mind we would naturally expect almost certain results from antiluetic treatment. Unfortunately, this is not the case, for specific treatment seems to be of little more value in this disease than it is in meta leucic diseases, as tabes and paralysis,

unless instituted very early when in some instances it cuts down the duration of the acute stage, especially in the second eye. The observation of neurologists that in cases of neurosyphilis malaria therapy seems to bring about improvement lead Marchesni to employ this treatment in interstitial keratitis. However, owing to the danger associated with this treatment he soon substituted typhoid vaccine and was able to report favorable results in that cases recovered more rapidly under the treatment and that the disease was often confined to one eye. We have had but one occasion to employ the typhoid treatment, that in a case of a luetic in whom antiluetic treatment and frequent instillation of atropine had failed to keep the pupil open. After three injections of the foreign protein the synechiae broke, giving a large wide pupil and the pericorneal redness disappeared. The corneal cloud remained.

Radiation has been suggested by Bywater in recent years, in the treatment of interstitial corneal disease, to be used once a week through a 5 inch spark gap with 1 milliampere of current. He reported undoubted benefit especially as regards relief of pain, photophobia and lacrimation when applied early. I would hesitate to subject an eye to x-ray treatment but prefer mercural inunctions with neoarsphenamine, instillations of atropine and hot compresses.

**H. G. Reynolds, Paducah:** I have nothing of scientific nature to contribute to this discussion, but I cannot resist the temptation to tell you of one case that I had before the days of the Wassermann reaction or salvarsan treatment.

This patient, a boy, eight or nine years old, I had treated on several occasions with inunctions of mercury. He was a known syphilitic, his father, a druggist, giving a clear history of syphilis. His uncle was a doctor. The boy had the typical symptoms referable to the teeth, and all the other evidences of congenital syphilis. Shortly after the last anti-syphilitic treatment I gave him, he developed diphtheria, and was given some forty thousand units of diphtheritic antitoxin, and when I saw him about a week later, his keratitis had practically cleared up.

About this time I came across Darier's work and found that he had been using diphtheritic antitoxin in many such conditions. Particularly the non-specific types of eye troubles. Of course this has been many years ago and I have used some types of foreign protein substance since that time, in many different eye conditions, finding in some cases that the whole milk will accomplish the result and in others that typhoid vaccine seems to have a better effect. That non-specific foreign protein has a beneficial effect on specific conditions, there is no doubt in my mind. Of course this brings to mind the controversy over the beneficial effects derived from the use of tuberculin in supposed tubercular eye conditions, and frankly to say, I some-

times question the specific action of tuberculin, but I reserve the right to change my mind about this matter within the next few months, as we are now treating several cases that may cause me to change my mind about it entirely.

As to swimming-pool conjunctivitis, I recall the case of a young lady attending boarding school in another state, who was one of about twenty-five girls to contract conjunctivitis while using a swimming-pool, and it was at that time thought to be due to chlorine. All of these cases cleared up without difficulty under ordinary treatment except one. This girl came to me after having been treated by another doctor who was inclined to think the eye was tubercular. I knew that her father was a syphilitic although the girl herself gave a negative Wassermann reaction. I put her on antisyphilitic treatment and continued it for a year. While she was under treatment the second eye became involved and went through the same course as did the first. The eyes finally cleared up and today she has 20/20 vision in both eyes and very little scar, fortunately, in the center of the cornea.

I am certainly glad Dr. Cowley brought up this most interesting subject for our discussion, as it never ceases to interest me.

**S. G. Dabney, Louisville:** I have listened to the paper and discussion with a great deal of interest, particularly with reference to the newer remedies—milk injections, the use of diphtheritic antitoxin, and so on, which seem to me to offer something in addition to the usual anti-syphilitic treatment, although I cannot speak from personal experience.

**Wm. P. Drake, Bowling Green:** Most of the interstitial keratitis we see is due to syphilis of the congenital type and usually affects both eyes. As a rule, only one eye is involved in the acquired type.

As to the injection of foreign proteins, I think one acts about as well as another; I see very little to choose from. In one case typhoid vaccine will produce excellent results, while milk, or some other foreign protein, will produce equally satisfactorily, or better, results in another case. It has been my experience that very few of the remedies suggested for interstitial keratitis offer any advantage over the old mixed treatment which, however, should be persisted in indefinitely. The use of atropin should also be continued for a long time, even after the eye has apparently cleared up.

I doubt whether anything other than the mixed treatment offers any advantage in the treatment of this condition; at least that has been my experience.

**L. P. Molloy, Paducah:** It has been my fortune to have seen quite a number of colored people, in whom interstitial keratitis is of comparatively frequent occurrence. In my early days as a medical student in Louisville, I was taught to use mercury and iodide of potash in these



cases, and I have seen so many of these patients that could scarcely count fingers at a distance of three to five feet, respond promptly to anti-syphilitic treatment, consisting of mercury inunctions in the early part of the disease, and heavy doses of iodide of potash, and within a reasonable time these children would go home with at least 20/20 vision; at least, that has been my experience.

I do not believe so much in the arsenical preparations in the treatment of this condition, but pin my faith to mercury inunctions and iodide of potash, along with rest, of course, atropin, hot fomentations, and exclusion of light in painful cases.

I have seen a great deal of this trouble in the colored race and my experience with this line of treatment has been unusually good perhaps.

**Octavus Dulaney, Louisville:** Something more than twenty years ago, when I was doing eye work, I reported two cases of interstitial keratitis due to malaria which came under my observation. Both of these cases were in young men who came from the so-called malarial section of the country and both gave a distinct history of malaria. They had undergone all forms of treatment for the eye trouble without avail; Wassermann's had been made and salvarsan given them, and apparently the eye condition considerably improved, and all of a sudden, almost over night, the trouble would recur and the cornea become cloudy again, and light caused such pain that it was necessary to keep them in a dark room. During these exacerbations of the keratitis they did not have chills, although both gave a history of having suffered from chills over a period of several years. One of these patients, accidentally as it were, was given some quinine which was followed by marked improvement in the eye condition. After checking up and verifying this, we began the use of heroic doses of quinine, and after a considerable period of this intensive malarial treatment in both cases, the eyes cleared up.

Other cases were reported about the same time with malaria as a predisposing cause. However, I do not believe it is the same type of keratitis as that of syphilitic origin; possibly more of a parenchymatous than an interstitial nature, but the symptoms are practically the same.

I simply pass this experience on for what it is worth.

**M. C. Baker, Louisville:** I have personally followed along the lines of the most conservative treatment for this condition; namely the use of atropin over a long period of time, along with mixed treatment, mercurials, etc., watching the diet meanwhile, particularly the intake of carbohydrates.

I would like to call particular attention to only one point. It has been my observation that

a good many of the neurological men lately have practically discarded arsenicals and are getting better results by trying to raise the Opsonic index or fighting power of these patients, and I believe that is what the use of milk injections does; it tends to increase the resisting power of the patient. They have also been using Pyreto and Physiotherapy, raising the patient's temperature to 104 or 105 degrees periodically over a period of time, and good results are claimed in cases of multiple sclerosis and tabes, making many of these patients useful citizens again. At any rate they have given us something to think about in the treatment of this condition and appear to have achieved some really remarkable results.

**D. M. Griffith, Owensboro:** The same treatment does not always produce the same results in all cases of interstitial keratitis. My own experience has been that, while syphilis is undoubtedly the underlying cause in nearly all cases, yet anti-syphilitic treatment does not always achieve the same results. Why this is I do not know; possibly, as Dr. Pfingst has explained, there are different forms of corneal involvement. I recall one case in which there was both iritis and irido-cyclitis, with the most intense pain I have ever witnessed, and yet anti-syphilitic treatment was practically without results. In desperation I injected milk sub-conjunctivally and it was followed by an almost magical relief of pain. I took a visiting Louisville physician out to see this patient and the man was enthusiastic about the manner in which his pain had been relieved. I injected 1 c. c. of milk into the lower outer quadrant of the eye. I have used sub-conjunctival injections of milk in some eight or ten cases with uniformly good results.

As to colored people, I also have seen a considerable number of cases and, because of the fact that they are practically always undernourished, in addition to specific or tubercular treatment as indicated, I invariably give these patients cod liver oil and, in my experience, it has been of material aid in the treatment.

**Claude T. Wolfe, Louisville:** In a condition such as this, in which syphilis is the underlying cause in the vast preponderance of cases, it would seem to be the part of folly not to use specific treatment as a routine measure. If I recall correctly, about two years ago Derby and Verheoff made the statement that they depended absolutely upon mercurial treatment in interstitial keratitis, while Gifford recommends the arsenicals in addition to the specific treatment. They agree that treatment should be instituted at the earliest possible moment, not only to improve the condition of the affected eye, but to avoid involvement of the other eye.

I have personally had no experience with the use of foreign proteins, but after listening to Dr. Cowley's paper and the ensuing discussion

on the subject, I shall certainly make use of them in the future.

**William Thornwall Davis**, Washington, D. C.: I can add nothing to what has already been said upon the subject of interstitial keratitis except to point out that Wilkerson has lately used diathermy in the treatment of these cases and claims to have secured very good results.

**R. H. Cowley**, (in closing): I agree with Dr. Pfingst that a large part of the trouble in these cases is the iritis and cyclitis which usually accompanies an interstitial keratitis.

I do not believe it is claimed that the foreign protein treatment has much effect upon the keratitis as such, but if we can successfully treat the symptoms that accompany it we will have done a great deal towards starting the patient upon the road to recovery. That is what the use of foreign proteins is for and it certainly appears to accomplish results along that line.

I am impressed by two things in connection with anti-syphilitic treatment; first, it seems to be the consensus of opinion that the arsenicals are not as effective as mercury, and while bismuth has been put on a level with mercury by some authorities, I am not prepared to say whether or not that has been conclusively demonstrated. Second, after a large experience with these cases in Vienna, Dr. Fuchs has made the statement that in spite of specific treatment, many of these patients go right on from bad to worse, the second eye becoming involved even while the first is being treated. That would not make us very happy if we had nothing to fall back upon when anti-syphilitic treatment is unsuccessful. Therefore, it behooves us to take an interest in the general up building of these patients—food, rest, and so on; we should not attempt to minimize that part of the treatment.

**Diagnosis of Cystic Degeneration of Kidney.**—Ratner and Zimhes state that cystic degeneration of the kidneys is a congenital defect difficult to diagnose because of its lack of specific symptoms, the evidence of a granular tumor in the lumbar region being the only objective symptom. One of the most frequent signs in polyuria, followed by oliguria as the condition gets worse and ends with anuria. The urine is of very low specific gravity and contains albumin. Early diagnosis is extremely rare, and the decisive points of the diagnosis are the finding of a unilateral or a bilateral tumor in the lumbar region and evidence of chronic nephritis. For several years the authors have made special roentgenographic studies of these cases and have found a characteristic general enlargement of the renal pelvis, frequently identical on the two sides.

## CATHETERIZATION VERSUS MYRINGOTOMY IN PURULENT OTITIS MEDIA\*

J. D. WILLIAMS, M. D.

Ashland.

One of the most frequent manifestations in the practice of an aurist, one that by reason of its possibilities for far reaching harm and demanding at his hands, as it does, immediate attention, is acute purulent otitis media.

Hesitancy here is culpable in the extreme wherever the blame may lie. To our credit, be it said, that any inaction here is that of the general practitioner or pediatrician. All too frequently the former particularly either does not recognize the condition or if he does he prescribes something to drop into the ear assuring the relatives or friends that nature in due time will give relief.

And is he not right many times in his opinion? Fortunately, many of these patients are permanently restored to a measurably normal state. I cannot agree that ever again is there complete restoration of the function of the middle ear where pus has been allowed to remain for even a few hours.

There is a misleading sense of near euphoria with the patient when pus anywhere bursts from its imprisonment; but unfortunately, as to the middle ear, in a considerable proportion of these cases the relief is only temporary, is merely the lull before the storm of mastoid cell involvement and destruction.

There is agreement among all competent ear men that drainage must be had and quickly. Universally a free myringotomy is practiced and it cannot be denied that such a procedure admirably meets the indications in respect to the relief of pain and the evacuation of the pus.

None the less, paracentesis is not free from serious objectionable features. The tympanic membrane, marvelously vesseled and innervated, functions in proportion to its resilience since upon this faculty very greatly depends the conduction of sound waves to the auditory brain centers.

The extraordinarily delicate mechanism of the middle and internal ear demands for its efficient behavior proper aeration of its blood supply and this is made possible by the patency of the eustachian tube, the folds of whose mucous membrane lie in close apposition in the normal state, to be opened periodically in deglutition, phonation, yawning and auto-inflation such as in sneezing and by blowing of the nose.

Any tubal mucous membranes that are not kept apart are prone to become adherent

\*Read before the Eye, Ear, Nose and Throat Section of the Kentucky State Medical Association.



on irritation. Hence the ease with which the patency of the eustachian tube may be blocked, with complete if only temporary closure, in the way of capillary attraction into itself of the ever present irritating material in the naso-pharynx, a true salpingitis resulting.

The residual air then loses its oxygen to the blood, negative pressure obtains, the drum is drawn inward, the vicious circle is complete and purulency of the middle ear cavity is, for the purpose of this premise, inevitable. The drum relation is now reversed by reason of the force from behind, it bulges and drainage is indicated, indeed it is imperative.

Unquestionably, always in children and in perhaps forty per cent of adults the membrane must be incised. Will any one deny that its freedom of movement must be materially lessened and a permanent hearing defect of some degree result as a consequence of its perforation, the injury to its nerve fibres and vessels, the possible slough from the local anesthetic and the unavoidable later scar formation. To avert this affront to a faculty so easily impaired, I have in selected cases, and in adults a considerable proportion may be so classed, successfully given and maintained drainage through the natural channel, and in the following manner, viz:

I had V. Mueller & Company make a fine silver catheter with a bulbous distal end, the proximal end of different metal and adapted to fit a Luer syringe. Bending the catheter at from 28 to 32 millimeters from its distal tip, at an angle of forty-five to sixty degrees, with the post-nasal mirror giving you a clear picture of the maneuver, the catheter lubricated with one (1) per cent silver ointment, is introduced through the eustachian tube into the antrum of the middle ear. The syringe is gently attached and slight suction withdraws the pus.

If the patient be rebellious to the mirror the procedure is possible with the naso-pharyngoscope, or for that matter, without either of such visual aids, as one ordinarily catheterizes, though admittedly with far less satisfaction to the surgeon.

Some patients will require anesthetization of the oro and naso-pharynx, perhaps the nares, to lessen their fears or their gagging, others object to the instrumentation not at all. Given the full cooperation of the patient, the procedure is not particularly difficult of execution. It reestablishes the tubal passage-way, provides natural and continuous drainage, is without harmful consequence if carefully carried out. This in contradiction to the classical incision whose ill effects have in a general way been set forth and admit of no denial.

The catheter may even be left in situ for

twenty to thirty minutes on occasion that any fixed contractions found be thoroughly dilated.

I submit that if no more than five per cent of these patients can be thus treated the plan is worthy of application wherever practicable.

#### DISCUSSION

**S. B. Marks, Lexington:** Dr. Williams is to be congratulated upon his paper and upon his contribution to the treatment of this so-prevalent condition.

The idea of drainage of the middle ear without incision of the drum membrane is, as we all know, not new, but so far as I know the method used with his especially made catheter is new, and I know all otologists join me in the hope that it will of service, especially in low-grade infections not a few of which tend to recur with each fresh cold, particularly should it be associated with a cough. Serious infections, as he states, must be dealt with early and free incision and continuous evacuation as far as can be accomplished.

Dr. Roy F. Nelson, of Oakland, Calif., advocated the use of ephedrine sulphate in 3 per cent solution as an adjunct to other treatment, hoping to aily the congestion and edema which enter largely into the later formation of adhesions in the middle ear and thickening of the drum membrane which contribute too much to later functional drainage.

Other methods of treatment advocated are needle puncture of the membrane with syringe suction and, in very early cases, in which suppuration is not present, the use of alternate gentle suction and inflation with a modified Politzer apparatus. I have only had experience with the latter method and feel that incision has been avoided in a few cases.

I again wish to commend Dr. Williams upon his originality.

**E. C. Yates, Lexington:** I have enjoyed hearing this paper very much indeed but I feel that there is at least one factor that must be considered in substituting this type of treatment for paracentesis. One must remember that different infections affect different parts of the middle ear and as we know most of these infections in children are epiretrotympenic infections. Assuming that we have an infection of the type that affects the attic of the middle ear, it would be utterly impossible to drain sufficient amount of this material to produce any permanent results by suction through the Eustachian tube. One major question that must be considered is whether we are dealing with an early suppurative ear or a catarrhal otitis media. This differentiation should be taken into consideration in adopting any type of treatment in preference to paracentesis. If it is a catarrhal ear, the result obtained from any such method must be purely palliative because the original

cause of the condition is still present in the nasopharynx and Eustachian tube.

A great deal has been said about the danger of frequent paracentesis. I have had occasion to examine one child who had had thirty-nine paracentesis and this child still has normal hearing as far as can be established by otometric and tuning-fork tests. All of us have tried various methods from time to time to get away from paracentesis. Of fifty cases of acute infection of the middle ear examined we advised the use of warm saline solution irrigations for five minutes every half hour for two hours. If the pain was not relieved, paracentesis was done. Of these fifty cases, twelve finally came to paracentesis.

I think Dr. Williams is to be congratulated upon introducing this type of treatment and I feel it certainly has a place in picked cases.

**D. M. Griffith, Owensboro:** In these cases where there is simple redness of the drum membrane without swelling, it is my custom to at once begin the treatment of the Eustachian tubes. We know that, especially in children, the trouble is generally due to lack of ventilation of the nose; therefore, I immediately shrink the nose and institute treatment twice a day with a silver solution dropped into the nose with an eye-dropper. I do nothing to the drum itself, because it is simply the result of a condition that has its beginning in the mouth of the tube, and if we can relieve the congestion and thereby establish drainage from the mouth of the tube, it will extend up the tube and drain out the middle ear itself.

I admire Dr. Williams' courage in going up there with a catheter. It would seem to be simply introducing traumatism in the presence of an already acutely inflamed condition in which a more soothing and palliative form of treatment would appear to be indicated. In my experience, the best results are obtained in these cases by treatment of the mouth of the tube, thus relieving the condition by removing the cause. If this does not relieve the patient within a reasonable length of time, there is nothing left except surgical treatment.

**Gaylord C. Hall, Louisville:** I do not like to criticize a method that I am not familiar with and have never used. I think we will all agree that treatment of the nose and throat is of the utmost importance in ear conditions, because in a majority of instances those are the points of primary infection.

The point I particularly wished to speak of is the so-called danger attendant upon the opening of an ear-drum. I do not believe I have ever opened an ear-drum too soon; on the contrary I have often thought that I have not opened them soon enough. I am not convinced that it does any harm. If one were experimentally inclined and would take a perfectly healthy tympanic membrane and make an incision in it,

I believe it would heal up and again become normal without any impairment of hearing. Who can say, after opening an ear-drum during the progress of an infectious otitis media, how much of the subsequent damage was due to the opening of the drum and how much to the disease itself, with its attendant ankyrosis and infection of the middle ear? My own opinion is that most, if not all, of the impairment of hearing which sometimes develops in these cases, is due to the effects of the disease itself rather than to the opening of the tympanic membrane.

I believe the drum should be opened early in these cases and that no harm is done thereby; on the other hand, we frequently get into trouble by delaying the opening of the drum.

**A. L. Bass, Louisville:** This is a subject that has interested me for sometime past, and I simply want to mention my method of handling these cases.

With a child where the drum is red, congested, no bulging, little or no temperature and pain, I have them use mild antiseptic drops into nares twice daily such as 1% Ephedrine hydrochloride in a 15% solution neo-silvol. Caution against blowing nose if it is stopped up for fear of forcing the infection up through the eustachian tube. The external auditory canal is to be irrigated with warm water three times per day. If the patient complains of pain and temperature goes up, I am to be notified: at which time it is most likely that the drum will need to be incised. A good many of the ears may be saved from myringotomy by giving the patient the benefit of the doubt, and it is much more satisfactory, especially from the patient's standpoint if a myringotomy can be avoided.

With an adult I use the same treatment as in a child with the addition of a local application of 4% cocaine solution to mouth of eustachian tube to be followed up with 2% silver nitrate solution. Sometimes I introduce the bougie dipped in cocaine solution into the eustachian tube, followed by a bougie dipped into 2% silver nitrate solution. This is what I call the abortive treatment. I have been preaching for years against the old accustomed remedy "5% phenol and glycerin drops" into the ear. They relieve the pain in some instances; mask the symptoms, destroy the epithelium covering the drum, make it appear normal more or less, so that it will not evidence the true pathology behind the drum; hence cause a delay in proper treatment, and predispose the patient to mastoid drainage if nothing worse.

**Octavus Dulaney, Louisville:** I have enjoyed hearing Dr. Williams' paper, and believe his method can be used to advantage in certain selected cases of the type which keep coming back to us and we cannot find anything much wrong with them, but I do not believe he meant to say that a patient with severe pain, bulging ear-drum, elevation of temperature and an increased



leucocyte count would be a fit subject for his suction method.

I have not used Dr. Williams' method, but he has given us something to think about and which can probably be used to advantage in mild cases where we have serum and not true pus or pathogenic infection.

**Walter Dean, Louisville:** We have Dr. Williams to thank for emphasizing the importance of suction in the treatment of ear disease. I had my first experience of using suction through the Eustachian catheter at West Point Military Academy during the war. Col. Haskins of the New York Eye and Ear was the chief medical officer and the inventor of the best suction apparatus on the market. He obtained remarkable results by the use of suction in the tube, in the external auditory canal in open ear cases and in sinusitis. Through repeated extractions of exudate from cavity allows nature to gain the balance of power. While suction can be depended on to empty the tympanic cavity through the tube in catarrhal otitis, early myringotomy is indicated in suppurative otitis, so that pus may escape by both avenues.

**Wm. P. Drake, Bowling Green:** Dr. Williams has certainly given us something to think about, but I do not believe his method of catheterization offers a means of relief in all cases. In sub-acute cases there is a mucus condition that will not be taken care of by catheterization, and in such cases we must open the drum and irrigate from the Eustachian tube out through the drum membrane to get rid of this mucus. That is the only way I know of relieving these patients. Occasionally in the acute stage, suction or catheterization may be very effective but where the case has reached the sub-acute stage I do not see anything else except to open the drum.

**J. D. Williams, (in closing):** I am afraid some of the gentlemen did not listen to my paper very closely. It seems to me basic that the primary cause of middle ear suppuration is lack of aeration of the middle ear cavity due to the closing of the Eustachian tube, and as I said in the paper, the suction is not the whole thing. The reopening of the closed tube is of equal importance.

Dr. Griffith mentioned the possibility of injuring the mucous membrane by the introduction of the tube. No harm can be done if the catheter is gently handled and thoroughly lubricated as outlined.

I agree with Dr. Dean that the adenoids are the primary cause of defective hearing and removal of these alone will often reestablish drainage of these suppurating ears.

I wish to express my appreciation of the liberal discussion that has been accorded my paper

## THERMO PUNCTURE OF DETACHED RETINA\*

WALTER DEAN, M. D.

Louisville.

My incentive to select this topic for a paper is a compensation case who attributes a detached retina to being hoisted off the ground two or three feet and then lowered to the ground on his feet. There is no contention of direct violence to the eye. The detached retina was not discovered for some days and when it was, the patient attributed the disability to the last dramatic episode of his occupation.

I would like to quote a definition of Simple Detachment of the Retina from a communication of J. Doggart and C. H. Shapland of Moorfields Eye Hospital, "Simple detachment of the retina means partial or complete separation of the layer of rods and cones from the retinal pigment cell layer arising either spontaneously or as the apparent result of minor trauma to the globe from direct or indirect violence. Indirect violence may result from a fall, a violent fit of coughing or a jolt occasioned by the sudden starting of a train."

When we study the present day conception of the mechanism of detached retina we can appreciate that most cases of detachment are spontaneous or on the verge of being spontaneous and the least trauma precipitates the inevitable. It was Leber of Heidelberg who first said that a sudden retinal detachment must be due to a tear or rupture of the retina.

He said this in 1882. However it was Von Graefe who first reported retinal holes, tears or ruptures. His theory of their origin was that of propulsion, believing that the fluid in the sub-retinal or intra retinal space increasing in volume finally pushed through the retina at the site of a weakened or diseased area. No doubt this theory has been the proper explanation of the small percentage of cases of exudative choroiditis origin. I have seen one postpartum detachment which was exudative or more likely transudative. Amaurosis and metamorphopsia in the right eye developed soon after delivery. A pinkish flat detachment with reddish vessels was seen far forward and above. This subsided completely with full restoration of central vision and full field in about three weeks. Fuchs mentions tubercular choroiditis as a cause of retinal detachment by exudation.

It was for the above mentioned Leber to advance the attraction or "pulling in" theory. Leber recognized the fact that chor-

\*Read before the Eye, Ear, Nose and Throat Section of the Kentucky State Medical Association.

adial exudate or transudate sufficient to detach the retina would increase ocular tension and he observed that hypotony rather than increased tension was the rule in detachment cases. He observed a case of perforation of the sclera followed by vitreous bands and ultimately by detached retina. He came to the conclusion first that vitreous bands in a shrunken vitreous pulled the retina in by centripetal traction, tearing a hole in the retina and that there was immediately a transposition of vitreous into the subretinal space with immediate detachment of the retina. In the absence of vitreous bands he explained the force as coming from interstitial contraction of pre-retinal bands as in retinitis striata.

Elschnig noticed that in retinal detachment with tears, he was able to usually find foci of pre-existing anterior choroido-retinitis with pegging of the retina to the choroid. If the detaching force, whether propulsion from without according to Von Graefe or attraction from within according to Leber, was sufficient to tear the retina, holes would be torn where the retina was pegged to the choroid. This much was known before most of us were born. It was also known that sometimes the choroid and sometimes the ciliary body were detached from the sclera by exudate or by expulsive hemorrhage. Neoplasms, particularly sarcoma of the choroid, are a common cause of detached retina. The entozoa particularly cysticercus subretinals, but also echinococcus and filaria are very rarely found in retinal detachments. A blow on the eye has long been known to cause the so-called macular hole, which is no doubt a hole in some cases but for some unaccountable reason does not cause detachment except to a very limited extent. It is believed that some of these holes are due to a spontaneous rupture of a cyst of the retina. It is also held by many authorities that some of the holes in the anterior part of the retina are caused by cystoid retinal degeneration. Holes in the region of the ora serrata are usually entered by fluid vitreous causing retinal detachment. This is not always so, as sclerotomies perforate the retina and yet detachment rarely follows. When it does, it is usually the result of vitreous hemorrhage which organizes into retinitis proliferans and pulls the retina from the choroid. I recall seeing a limited retinal detachment in an intra-ocular foreign body extraction case well forward in the floor of the eye six months after the operation. The detachment corresponded with the site of entry. It happened to be almost opposite the sclerotomy. It is well accepted that an extensive lesion of the retina at one pole will so pucker and fold the retina that

the membrane will be pulled off at the opposite pole. Another cause of detached retina is the sudden lowering of tension in perforating ulcer of the cornea. No doubt there is a generalized infection or affection of the entire uveal tract complicating the corneal lesion.

This same sudden lowering of tension in glaucoma operations has caused detachment of retina and even choroid, when the choroidal vessels are atheromatous. Less often this catastrophe follows cataract extraction in hypertensive cases especially in diabetics and nephritics.

Myopia cannot be ignored any longer. Majewski in a recent article made two points very well. The first pertains to great increase of the contents of the eye in high myopia. He says: "We know that high myopia leads to notable augmentation of the eye ball which we may assume to be approximately spherical. Now the surface of a sphere which enlarges, increases proportionately to the square of the radius and the volume proportionately to the cube of the radius. Let us take a simple example and suppose the radius is increased to double its length. In such a case the surface is quadrupled and the volume increased eight times. It is clear that under these conditions the membranes forming the envelopes of the eye must undergo a high degree of distension, whilst the vitreous body, which is insufficient to completely fill the enlarged cavity, imbibes fluid from the surrounding tissues. In this way arises degeneration of the vitreous. The sclera, more extensible than the other coats becomes stretched and thinned without creating any serious disturbance in the functions of the eye. The choroid continues to line the enlarging fundus; becoming thinned and in some instances widely atrophied. On the other hand, a membrane so fine and delicate as the retina cannot tolerate stretching to an indefinite degree. What happens? The retina becomes detached, separated from the wall which it is no longer capable of covering."

He further makes the point that some myopic eyes enlarge equally in every direction, that is spherically, which makes the demand on the retina and vitreous much greater than when it becomes irregularly oblong.

We have all observed floating opacities, small retinal hemorrhages, anterior choroido-retinitis, decreased ocular tension and fluid vitreous in these enlarged eyes and we have always known that they are particularly predisposed to detached retina. The wonder is that they do not all go to detachment. The retina is unattached to the choroid except at the papilla and the ora serrata and is only held against it by the supporting pressure



of the vitreous. When the vitreous shrinks, or at least is outgrown by the expanding sclera, the retina loses support from within. The inextensible retina remains too small to cover the expanding sclero-choroid. There may or may not be pegging down of the retina by foci of anterior choroido-retinitis. The gel mass of the vitreous becomes liquified into a sol containing opacities. Whether fibrillae of the pulp are entities or artifacts remains to be proven but it is generally accepted that they are normally present and in a degenerate vitreous become thick and tortuous. These fibrillae are said by Vogt to make up the scaffolding of the vitreous body and which, being attached to the internal limiting membrane, pull upon the retina, tearing it.—Schlenderung. It is no wonder that Majewski estimates that detachment finally develops in over 5% of myopic eyes, and that Nordeson in 1100 collected cases of detachment found 80% were in myopes, with 50% over 50 years old.

Now we shall return to the Leber theory of attraction, traction or "pulling in." About twenty years ago Gonin of Lausanne, became particularly interested in detached retinae. His clinical and experimental work verified the observations of Leber. He became a retinal hole, rent, or rupture enthusiast. He spent hours a day looking at one detached retina and repeated the search day after day, and he usually finally succeeded. These holes are from 1/4 disc diameters to 12 D. D. He says in one article that in 180 cases of detachments carefully examined only 26 failed to reveal a hole. Of these failures eight had corneal opacities and 5 displayed the retinal holes during the course of treatment. Other details observed were vitreous opacities, retinal hemorrhages and areas of choroido-retinitis. Of course the hemorrhages were small and only seen in recent cases. They are due to traction and peeling off of the internal limiting membrane. He considers foci of choroido-retinitis and hemorrhage as most important clues to the location of hole.

The simple serous detachments of spontaneous nature are almost invariably due to the pulp of a shrinking vitreous being adherent to the retina, particularly in the upper part of the retina, particularly in the periphery of the retina approximately 12 m. m. for the limbus. The point or points of adhesion are usually in single or multiple foci of choroido-retinitis. These foci are caused by myopia, senility, sepsis, syphilis or are cryptogenic. Plastic cyclitis is the cause of some. In the adhesions are sometimes found epithelial cells migrated from the ciliary body. The eye moves, there is a cough, a jolt, a blow. If it is severe enough yet, the tweak causes

photopsia. If the retina is ready to tear, a hole forms. It may be round, crescentic, spear shaped, horse shoe shaped or festooned. The degenerated vitreous pours through the opening and dissects down the retina. Often the detachment appears below the macula and the rent is found near the ora-serrata above. The history is often invaluable in detecting the initial lesion. I have three times had patients tell me that when the metamorphopsia or monocular diplopia first started they could see the top of a man but not his legs. The hole is more often above, because in our upright position, the vitreous pulp pulls down from the point or points of fusion between the hyaloid membrane and the neural portion of the retina. Gravity works in favor of the inferior adhesions and against the upper ones. Bruce Hamilton of Moorfield's Eye Hospital says that finding the hole is the *sine qua non* of Prof Gonin's operation for ignipuncture. He describes the holes as single or multiple. As to size and shape there are tears or disinsertion at the ora serrata which may be rather large; small round holes, some as small as three-eighths of a millimetre, which are usually found from one to one and a half disc diameters behind the ora serrata and seldom as far back as the equator; horse shoe rents which are usually of traumatic origin vary tremendously in size, one extending from six to two o'clock and back to six again. He does not expect to find a hole in sarcoma or inflammatory detachments but he expects to find a hole in myopic and traumatic detachments or a combination of both conditions. After emphasizing the importance of chiseling a good history out of the patient as to where in the visual field the scotoma was first observed, he discussed the relationship of the site of the detachment to the causative hole. When the detachment is still above, the hole is there too.

If the detachment is localized to the medial or lateral position one can be fairly sure the hole is on that side, usually in the upper third of the detachment. As most detachments finally settle to the lower part of the eye the hole may be found quite apart in a portion of the retina which appears to be completely in position or it may be below in the detachment itself. As I said earlier, Von Graefe was the first to report holes of the retina. Sir William Lister in *The British Journal of Ophthalmology* of 1924, said in despair that not one single detachment with hole had ever been cured in the British Empire. No doubt he could have included the United States. In Vail's now famous questionnaire on detachment, he received 281 replies. 250 had never cured a single case. 25 had cured one case and 6 had cured more than one case. The subject of holes was not

discussed. But in 1916 Gonin found a hole in an old detachment in a blind eye. He fortunately arrived at the correlation that if a hole makes a detachment, the way to cure the detachment is to plug the hole. He proceeded to locate the corresponding spot over the sclera and entering this with galvanocautery sealed the hole and attained an anatomical cure. His present technic is about as follows: He and his assistants study each case an hour or more a day, for many successive days if necessary, until a hole or holes are found. He uses the indirect method of ophthalmoscopy, the condensing lens being +16D which makes a rather small image. He finds the hole. He then ink dots the limbus at its intersection with the meridian of longitude which bisects the hole. At 180 degrees from this he makes another ink dot on the limbus. This establishes at what o'clock the tear lies and is supposed to be rather easy to do accurately as it involves only the element of direction. The more difficult feat is to calculate the distance of the anterior holes or tears from the ora serrata or the posterior holes from the macula. This is done by estimating the number of disc diameters (D. D.) to either anatomical point. He assumes that a disc diameter is 1.5 m. m. and that the ora serrata is 8 m. m. behind the limbus. Clinically the ora serrata is the most anterior point of the fundus which can be viewed ophthalmoscopically through absolutely full pupil dilatation with the eye turned in the same direction. Take for example a hole at 2 o'clock 2 D. D. behind the ora serrata. The ora serrata is 8 m. m. behind the limbus. Two D. D. equal 3 m. m. more. The hole then is 11 m. m. behind the limbus. The operation is done under local anesthesia, mostly by subconjunctival injection of novocaine since much cocaine dulls the cornea for ophthalmoscopic investigation. The pupil is fully dilated.

A 1.5 c m. curvilinear incision is made through the conjunctiva about 5 m. m. behind the limbus. Tenon's capsule is dissected up, widely exposing the sclera over the approximate area. If the tear is at 2 o'clock, a knotted thread is passed through the ink dot at 8 o'clock, passing across the cornea through the ink dot at 2 o'clock and threaded into a lid retractor. The retractor lifts up the conjunctiva and capsule and carries the thread in a straight line over the bared sclera. This thread is outlined with sterile Indian Ink and then removed. Next an ink dipped caliper marks 11 m. m. from the limbus on the ink line and the point for school sclerotomy is located. A Graefe knife is passed through the sclera and choroid at this point and slightly turned to evacuate the sub-retinal fluid. Then a red hot Paquelin cautery is intro-

duced through the puncture to a depth of two or three m. m. and allowed to remain two or three seconds. The conjunctiva is sutured, atropine is installed, the cauterized area examined ophthalmoscopically, bandage is applied and patient is put to bed for from four to ten days. The cautery is expected to strike the tear centrally causing a soldering action. In recent cases Gonin expects the cure to be immediate, complete and permanent. He reports 70% of cures in cases seen within three weeks from onset, and 50% in one to three months. He regards favorable factors as follows: Recentness, singleness of hole, small size of hole, absence of gross vitreous opacities and uveal disease. He regards as unfavorable old detachments, hypertension, diabetes, senility, holes behind the equator because they are near venae vorticosae. In 300 cases, there were twelve fairly grave hemorrhages, seven of which were severe. For some unaccountable reason hemorrhage when it occurs, comes about the sixth or seventh post-operative day. Immediate failures are sometimes found to be caused by overlooked additional holes, which are found when the billows are smoothed out by the first operation. Many cases are operated more than once. Gonin insists that success demands that the hole must be included in the synechia between retina and choroid. The adhesion is usually three times the size of the scleral opening of 2 m. m. showing post-operatively as a circular white patch 6 m. m. in diameter. No doubt the important part of the operation is to produce sufficient choroidal reaction so that the retina may be firmly fused to the choroid. Herbert Fisher thinks it would usually be impossible to so accurately localize the scleral point, that the cautery would touch the hole. He thinks sufficient cauterization in the approximate region would produce an adequate ring synechia. Josef Meller does not expect to strike the hole routinely on account of the great technical difficulty. It is well agreed that the spot on the sclera cannot be determined mathematically but is located as Gradle says by rough clinical estimation. All Europe has become igni-puncture minded since the Congress in Amsterdam. No doubt a brilliant result has been attained in an heretofore hopeless condition. Considering the variable pathology underlying these cases, much of which is still obscure we must not expect too much. Nor, it seems to me, must we expect too much of ourselves in selecting suitable cases and applying this technically difficult operation.

"The determination of the exact spot on the surface of the sclerotic which overlies the retinal hole, in a variable but in all cases different plane, must be a matter of such ex-



treme difficulty as to be almost impossible; only an approximation can be achieved. When Gonin's operation succeeds it does so because if the site of puncture has been determined with sufficient accuracy, the retina falls back into opposition with the choroid, as the sub-retinal fluids drain out, in such a way that the portion in which the hole exists corresponds with the site of puncture; the choroid at this point, responding to the stimulus of the cautery, pours out an inflammatory exudate which organizes and firmly attaches the adjacent part of the retina and in so doing forms as it were, an annular synechia for the retinal hole."

#### DISCUSSION

**Adolph O. Pfingst, Louisville:** Dr. Dean has given us a timely paper to which he has evidently devoted much time and thought. The pathogenesis of ablatio retinae has always been a subject of extreme interest. The essayist has pointed out to us that the retina has but two attachments to the underlying structures, one at the optic nerve head and one at the ora serrata. He also pointed out the accepted theory that the retina is held in opposition to the pigmentary layer and choroid by intraocular pressure alone. While I know that there is no organized union between these tissues I cannot subscribe to the idea expressed by Dr. Dean. When we stop to consider that the least distortion of the retina, say from slight sub-retinal effusion or hemorrhage, is associated with confusing metamorphosis it would not seem feasible that the retina can be kept in perfect adaptation to the middle coat by pressure alone. You are, of course, familiar with the theory that the rods and cones project slightly beyond the retinal surface and that they dovetail into irregularities of the adjacent pigmentary layer. Personally I am of the conviction that there is some kind of cement substance holding the retina in smooth contact with the adjacent layer, just as an intracellular cement substance unites epithelial cells throughout the body. Be this as it may, it is evident that the question of detachment of the retina must be explained in a physical way; this is in a difference in pressure on two sides of the membrane. If the pre-retinal and subretinal pressures are equal, or the pre-retinal pressure exceeds that on the other side, of the membrane, detachment is not apt to follow traumatic retinal tears; in fact, it appears that spontaneous closure of such tears usually takes place. An exception to this rule occurs in the presence of liquid vitreous which might find its way behind the retina and lift it from its bed. Where the pre-retinal pressure is lower than the subretinal, we can then figure the creation of a suction force which lifts the retina and allows an effusion to develop beneath the membrane. We are, of course, all familiar with detachments brought about by sub-retinal

hemorrhage or effusion and by the development of a neoplasm in the choroid.

In the cases of detachment in myopes the assumption seems reasonable that the retinal stretching does not keep pace with the expansion of the choroid and sclera and that this lifts the retina from its bed. In the spontaneous detachments the question arises as to what brings about the physical conditions that lead to the trouble. You are, no doubt, familiar with the theory that some alterations in the activity of the ciliary process occurs, which results in degenerative changes in the uveal tract and the vitreous along the retinal surface thus lessening the pre-retinal pressure and favoring lifting of the retina. It is in this variety of ablatio that primary tears occur which sometimes antedate the detachment though most tears are secondary and are caused by stretching of the retina.

Regarding the use of ignipuncture, I admit my inexperience for I have not had a case since the introduction of this treatment in which I could apply it. I cannot conceive of the possibility of localizing the position of a tear by means of ophthalmoscopic examination so accurately as to be able to approach the exact point of lesion through the sclera. My version of the cure in these cases is that the retinal tear is not soldered by the cautery but that the cautery merely serves to bring about a reaction which results in the agglutination of the retina to its bed.

If opportunity should present, I would be inclined to treat the condition by making two small scleral trephine holes over the area of the detachment and then make a very brief cauterization—a mere touch of the cautery point to the opening. Surgical treatment of detached retina sounds rational and I am convinced that it will, in the future, lead to something worth while.

**Walter Dean, (in closing):** I appreciate Dr. Pfingst's scientific discussion. All agree that the retina is illy supported. I had thought before I heard Dr. Pfingst's discussion that there were no bonds of union between the retina and choroid except at the papilla and the ora serrata, but that the retina normally stuck to the choroid because the elastic vitreous gel, which is formed by the retina throughout foetal life, filled the cavity exactly according to a Divine plan. Evidently the vicissitudes of the vitreous body are many. In high myopia the dilated sclera outgrows or outstretches the interior structures. As I have said the retina may have to tear. The vitreous gel which is unstable and probably never regenerates after birth, becomes degenerated. The deficiency in volume is made up by the common intra-ocular fluid which is a dialysate from the capillaries of the ciliary body. I take it there is a constant accommodation between cavity and contents. The vitreous body is not a tissue but a tissue product. As

we grow into the knowledge of its physico-chemical changes, we will not only better understand the etiology of spontaneous retinal detachment but will learn more about the etiology of glaucoma.

Gonin's operation for spontaneous detachment of the retina has been applied successfully in every European country. It offers us a difficult solution to a hitherto hopeless problem.

# ETIOLOGY OF MIDDLE EAR SUPPURATION WITH SPECIAL REFERENCE TO SINUSITIS AS A FACTOR\*

A. L. BASS, M. D.

Louisville.

Relative to sinus complications, I feel satisfied that they are by far more often present than discovered or reported; but the ratio is becoming much less due to the work of L. W. Dean, who I believe, is the pioneer worker in this field, and several others who have flashed reports since he has brought the importance of the involvement of the sinuses to our notice.

As for the ear, it escapes our notice relatively rare because its importance of involvement, complications and symptoms have been discovered, known and taught for a much longer period. The sinuses in children are assuming more importance and increased attention as times passes. The presence of an unsuspected chronic infection of the ethmoid or antrum is not an uncommon occurrence. The same statement applies to adults.

In 1924 Watson Williams reported for two consecutive surgical mastoiditis cases with infected nasal accessory sinuses in twenty-eight instances.

Dr. Daniels has proven that a diet deficient in Vitamin A produced suppurative sinusitis in rats; that, if the Vitamin is replaced in the diet within sufficient time, before the disease has progressed too far, the sinuses will clear up; but if too far gone, even correction of the diet will not restore the sinuses to their normal state. When such a condition exists it is necessary to drain the involved sinuses and apply proper local treatment together with the proper dietary correction before the sinuses are restored to normal.

It is difficult to discuss incidence of middle ear and sinus infection relative to acute infectious diseases without considering the etiological factors such as, deficient diet; metabolic disturbances; allergy; endocrine disturbances; blood dyscrasias; improper hygiene, relative to proper clothing and ventilation; climatic, relative to sunshine;

swimming, especially pools; septic tonsils and adenoids; abnormal nasal chambers.

The ease with which infection invades the ear and sinuses is dependent upon one or more of these predisposing factors. It is evident that the same infection in a well nourished child does not have the same significance as in a poorly nourished one. The healthy child eradicates the infection with little treatment and slight damage; while the child with inanition will have a great deal more difficulty in getting well.

Fowler in an article, "Incidence of Nasal Sinusitis with Diseases of the Ear," reported one hundred cases (two hundred ears), found there were five non-suppurative otitis media, thirty-seven healed suppurative otitis media, thirty-four suppurative recurrent otitis media, thirteen of chronic otitis media, and eleven of nerve deafness. The diagnosis was not made from the immediate pathology present, but from the entire history.

History of discharge or pain.....	78%
History of exanthemata.....	65%
History of colds "flu," pneumonia	66%
History of mastoid operations.....	7%
History of vertigo.....	12%
History of tonsil and adenoid operation .....	53%

The x-ray findings in the mastoid and sinus pictures were interpreted by no less an authority than Dr. F. M. Law. As for the ear thirty-two per cent of the cases showed slight involvement of the cell lumen (forty-five ears). Twenty-seven per cent showed areas of absorption (thirty-seven ears). Nineteen per cent showed abnormal septums in the mastoid (twenty-three ears). These findings were in direct proportion to the chronicity of the suppuration. The ethmoid and antra were recorded as they were practically the only cues involved. As for the sinuses thirty-six per cent showed a moderate involvement; fifteen per cent moderately severe; six per cent severe; a total of eighty-six per cent. In that eighty-six per cent of the youngsters with ear diseases had sinus infection, he states that without the x-ray only a few of these sinus involvements would have been correctly diagnosed.

According to x-ray findings, there were five with condensing osteitis; nineteen with absorption of septums; forty-seven with edema of septums; a total of seventy-one with pathological changes in the septums. Added to these fifteen others with definite involvement of the bony spaces of the sinuses make a total of eighty-six per cent.

While x-ray and transillumination are both valuable aids in the diagnosis of sinusitis, the x-ray more valuable, neither is infallible.

\*Read before the Eye, Ear, Nose and Throat Section of the Kentucky State Medical Association.



Fowler reports a six year old child with acute congestion and ear aches (without discharge) coincident with an exacerbation or reinfection in her sinuses; in which x-ray was negative; yet there was a sinusitis with thickened membrane with the usual clinical picture.

This high percentage of coincidental involvement does not mean that we cannot have ear diseases without sinusitis or visa versa; but it does mean that they frequently occur together and we should be on our guard, as in order to eradicate one condition we have to eliminate the other.

A conclusion of Fowler's worthy of note is that, "Progressive deafness with so-called recurrent otitis media of the middle ear, occurs more often than does progressive deafness without otitis and in many cases in which the condition is diagnosed as otosclerosis, a history of inflammation in or about the middle ear may be obtained if persistent questioning is focused on this point. I have little doubt but that true otosclerosis may be caused in part by inflammation in the sinus spaces in and near the ear. The otosclerosis is a terminal process of a prior disease."

In pneumonias of infancy it is known that ninety-five per cent that come to autopsy show suppurative otitis.

Carmody states, "Infection in the sinuses is much more pernicious than any other focal infection with the possible exception of the tonsils; and in both for the same reason, because absorption of the toxin may be supplemented by ingestion as well."

Briefly, I wish to report four cases:

Case 1. D. C., aged 17, seen January 30, 1930. Scarlet fever three weeks ago, from which she had apparently recovered. For three days has had pain in right ear. Examination: Congestion of nasopharynx. Tonsils, out; adenoids two plus. Right drum congested, bulging, tenderness on pressure over tip of mastoid. Temperature 104.4. Under gas anesthesia right drum was incised. Warm saline irrigations for right ear tid and antiseptic drops for nose were ordered. Next day patient's temperature ranged from 99.4 to 103.2, when it stayed around 99. February 4th, five days later, patient said she had slight pain in cheeks. Intra nasal examination did not elicit evidence of sinus infection. X-ray of antra as well as mastoid; showed antra cloudy; also mastoid involvement. Both antra irrigated pus, right two plus. Left three plus. Antra irrigations every two or three days continued to reveal pus and the right ear continued with pulsating discharge, increased congestion of drum and sagging of posterior superior canal wall. February 17, simple mastoidectomy right

side, with intra-nasal drainage of antra was done. The middle ear ceased to discharge within ten days to two weeks. Antra irrigated clear on the twenty-fifth day and the patient went on to an uneventful recovery.

Case 2. Miss E. M., nurse, age 19. Seen September 10, 1930. History: pain left ear for twelve days, when ear began to discharge with relief of pain. Examination, pulsating discharge with small perforation inferior. Temperature 99.2. Treatment, myringotomy was done under local anesthesia for better drainage. 1/5000 solution of Bichloride of Mercury irrigations tid and antiseptic drops into nose were used. Sinuses transilluminated negative and there was no evidence of any sinus involvement in nares. Left ear gradually went from bad to worse; canal wall congested, drum thickened from continued inflammation plus pulsating discharge. X-ray, cloudy mastoid. W. B. C. 17,850; Lymphs 17, Staff 16, Polys. 76, Hg. 80.

Simple mastoidectomy was done October 3rd. Free pus was found. For first week wound progressed favorably, but continued to discharge and failed to close in spite of through and through irrigations with 1/2500 metaphen solution and occasional 1% silver nitrate solution. The nose was inspected and antra transilluminated frequently for foci. Tonsils two plus, submerged, with evidence of little or no pathology. On November 28, 1930 practically two months after the original operation, I reopened the mastoid but did not find any evidence of neglected pathology from previous operation. Tonsils were removed at that time; mastoid wound and middle ear continued to act as before. January 15th, told her to have sinuses x-rayed and bring pictures to office with her two days later. X-ray showed left antrum cloudy; irrigations showed muco-pus about 4 c. c. On second antrum lavage, the ear was essentially dry. Wound closed nine days after the initial lavage, perforation had closed. February 7th, twenty-one days later, antrum irrigated clear and subsequent x-ray was negative.

Case 3. D. A., age 52, seen October 12, 1931. History: right ear discharged six months, following roaring sound. Never had had any pain. Three or four years ago had same trouble with right ear, discharge lasting two months.

Examination: Right drum thickened, congested, perforation posterior inferior with pulsating discharge. Temperature normal. No tenderness over mastoid region. X-ray showed involvement of posterior and above canal. Sinuses transilluminated negative. He had four or five abscessed teeth. Advised extraction. After the removal of teeth and the use of cotton wicks in his canal according to

the Pratt method, his ear ceased to discharge within a few days and remained dry for a few weeks, when it began to discharge again. Upon transillumination at this time, his right antrum was slightly dark and upon irrigation, muco-pus was present. Upon clearing up the antrum, his ear became dry and has remained so.

Case 4. Mrs. A. M., age 36, upon whom I had done a simple mastoidectomy left side following scarlet fever, February 17, 1931, from which she made a complete recovery. November 28, 1931, nine months later, she came to office stating that two days before she had slight pain in left ear for a few hours followed by discharge. Examination: Left ear pulsating discharge with central perforation. No other evidence of pathology, save slight congestion nasal mucosa. Temperature normal. Treatment consisted of antiseptic drops into nares with boric acid irrigations for the next few days. December 5th condition same. Transillumination showed left antrum dark. Irrigation produced pus. Cotton wicks were used in canal, irrigations stopped. Left antrum was irrigated the 10th, 12th, 15th and 20th when ear became dry and perforation closed. On the 25th antrum irrigated clear.

Via conclusion, I wish to call your attention to the relation of the ear and sinuses to the respiratory tract; they both empty into the upper respiratory tract: the ear by a tube which is easily blocked up when it is infected due to congestion and inflammatory reaction, readily producing subjective and objective symptoms; while the sinuses have openings which are not so likely to produce subjective symptoms due to a blocking or damming up of the infection as in the ear; and a great many of the sinus infections are milder. As a consequence many of the sinus infections are over looked; but even so, it behooves us to be on the alert and ferret them out as often as possible.

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#### DISCUSSION

J. D. Williams, Ashland: I would be glad if the essayist, in closing the discussion would touch upon the inter-relation of the various parts of the body to the ear. Some one, I do not remember whom, has said—that he who would treat the ear—shall I also say the eye?—must necessarily know the whole body. Any man who plans to make a specialty of the eye, ear, nose and throat would do well to first put in five

years in active general practice. The knowledge gained in years of general work has been of inestimable value to me.

The essayist stressed the importance of abnormal nasal chambers and consequent sinus deficiencies. I have found that in practically every case of obstructive deafness there is a material degree of deflection of the nasal septum, and this should be corrected as early in life as possible and practicable. It is conceivable that even perceptive defects could be ameliorated by the improved ventilation of unhealthy sinuses.

In an extensive review of the nasal accessory sinus literature covered in my paper of September, 1929, it was shown that many of the world's leading men in our field questioned x-ray findings, some decidedly preferring transillumination, others damning radiography with faint praise, practically all agreeing that experience giving a sixth sense evaluation of clinical evidences was all that was necessary in the predominant majority of cases. With this I am in entire agreement.

S. G. Dabney, Louisville: Dr. Bass was kind enough to let me read his paper, but as I have had no personal experience along this line, I can only thank him for the courtesy and say that I have thoroughly enjoyed hearing him read the paper.

I would be glad if, in closing, he would tell us how the association he refers to occurs—whether by direct infection through the eustachian tube or by some other route.

Gaylord C. Hall, Louisville: I have very much enjoyed hearing this excellent paper. The essayist has called attention to a class of cases which, as he has pointed out, are very frequently overlooked, but which, following the work of Dean and others along this line, are now diagnosed much more frequently than heretofore. It is not surprising that, in the presence of a primary infection of the upper air passages, there should be an associated sinusitis and we should be on the lookout for it in all such cases. It is, however, frequently very difficult to say whether one sinus or another is infected. It is true, I think, that we will have to do surgery on the antrum very much more often than on any other sinus in these cases.

I think one of the most unfortunate occurrences that we have to contend with is infection of the ear following a nasal operation. When this does happen it is apt to pursue a rather malignant course, and it is very embarrassing to all concerned when it becomes necessary to tell these patients that they must be operated upon a second time.

As to infection occurring in children showing abnormal nutrition, we should expect it.

In all cases showing recurrent infections of



the ear, we should investigate the sinuses carefully, especially if the tonsils and adenoids are out and there is no focus of infection in the naso-pharynx; it is very apt to be found in the sinus itself.

**E. C. Yates**, Lexington: I have enjoyed hearing this paper very much indeed and there are just two points that I wish to touch upon. One is that most of us neglect or overlook the importance of instructing patients with infections of this kind in regard to blowing the nose properly.

Most of our text books tell us that the lymphatic drainage of the accessory sinuses is posteriorly into the retropharyngeal nodes. No doubt all of us have seen cases of early malignancy before pressure necrosis can occur slough and pass carcinoma cells into the nose. This is certainly sufficient evidence of a poor lymphatic drainage as well as a poor blood supply to the mucous membrane lining. It is questionable just how much absorption through the blood stream or lymphatics occurs from infected sinuses. It is much easier to assume that infections occur by direct extension into ear or by aspiration into chest.

**S. B. Marks**, Lexington: Some years ago, Dr. Stucky got into the Associated Press dispatches by making the statement in a public address that the nose was not a pump-handle and should not be used as such. I agree with Dr. Yates that the majority of mothers instruct their children to hold one side of the nose closed while blowing it. The importance of this has been impressed upon me by having seen so many cases of infected ears without the presence of nasal infection in children who have a cough from some cause or other, possibly the tonsils or a hang-over from whooping-cough.

Personally, I attach more importance to ventilation than to antisepsis and always in prescribing nasal drops I include ephedrin in sufficient strength to cause shrinkage. This helps evacuation and of course ventilation is the thing that we are primarily after.

I do not believe enough stress has been laid upon the posterior sinus as a focus of infection in many of these cases. Practically all the infected ears I have seen this season have been associated with a low-grade pharyngeal infection; I have not seen a mastoid in one of them, most cases showing very little elevation of temperature and clearing up rapidly under myringotomy.

Another thing we must be careful about is the method of using nasal drops. Dr. Beck, a number of years ago, advised throwing the head well back, introducing the drops, then inverting the head completely, allowing the drops to trickle into the nasal passages. I hardly think this method can be improved upon.

As to treatment of the middle ear, I have never been sold on irrigation; I prefer antiseptics

administered with an eye-dropper, with gentle instillation and suction, to irrigation of any sort. I think more harm can come from irrigation in the hands of a mother not experienced in its use than can be offset by the benefits to be derived from it.

**Walter Dean**, Louisville: Dr. Bass has given us an important paper on an interesting subject. In one of his personal cases it seemed a question whether the ear suppuration was a sequel to suppurative sinusitis or whether both arose from a common origin. Naturally in influenza and scarlatina, both ears and nose are often affected simultaneously. Dr. Dabney and I have marveled together at the rarity of ear complications secondary to suppurative sinus disease. It seems incredible that sinus pus could bathe eustachian tubes for weeks, months and years and the ear be unaffected, yet this is the rule and exceptions are few. I understood Dr. Bass to write as his opinion or to quote that oto-sclerosis is caused by sinus disease. My conception, or rather the consensus of opinion, is that oto-sclerosis is a congenital or prenatal condition which is made worse by sepsis, childbirth, large operations, shock, fatigue and by many toxic substances such as alcohol and tobacco.

**Octavus Dulaney**, Louisville: I have seen a number of mastoid cases in which x-rays revealed involvement of the antrum on the same side. It is not necessarily limited to the antrum, there may be other sinuses involved, especially do we find this in children.

One of the greatest dangers of the present day is due to our failure to instruct patients with sinus trouble not to go into swimming pools. When I was a boy I learned to hold my nose while diving, but the young people of today do not practice this and when they dive from high points and strike the water with considerable force, there is bound to be a lot of water carried into the middle ear, and sometimes there is pus in the nose and this is carried along with it.

Some years ago, my attention was called to the frequency of antrum involvement in mastoid cases. Frequently we see an antrum case and wash it out and do not find pus, and two or three weeks later the patient develops a slight cold, with exacerbation of the sinus symptoms, and we wish it out again and this time we find plenty.

This subject requires a great deal of study. I recently saw a child six years old, whose mental development appeared to have been retarded; in fact, the doctor who brought him to me remarked that the child "did not have all that was coming to him." His tonsils and adenoids had been removed without apparent benefit. In many of these cases of children who are under-developed and poorly nourished, we x-ray the sinuses. We did so in this case and

it showed sinus involvement. There was no evidence of any infection of the ear—no acute symptoms; therefore, I did nothing to the ear, but instituted treatment along medical lines for general improvement of the patient's condition. With the better food the child has been getting along with 20% neo-silvol and 1% ephedrin hydrochloride in normal saline; he is making wonderful progress; the sinuses are clearing up and he is able to talk plainly, whereas previously it was impossible to understand him.

**A. L. Bass**, (in closing): I wish to thank the gentlemen for their liberal discussion of my paper.

These cases must be worked out along individual lines. I use the x-ray, I do not think we can get along without it; therefore, I use it routinely in doubtful and chronic cases and draw my own clinical conclusions.

Dr. Dabney asked how the infection spreads. Most authorities agree that it is through continuity that the infection gets into the middle ear, which I think is very plausible.

In an article published a few weeks ago, Fowler says that 86 per cent of cases of middle ear infection have mastoid involvement. Several weeks ago I had an opportunity to ask Dr. Dean of St. Louis, what percentage of middle ear infections showed sinus involvement and he said practically all of them. He is quite an authority as you know.

Relative to blowing the nose, if a patient has acute congestion of the middle ear and the nose is stopped up, tell them not to blow it. My own belief is that nasal drops should be used in these cases. I have under observation at the present time a student who has just recovered from scarlet fever. He has a pan sinusitis, complicating; left side. He recently complained of a point of sensitiveness on the left side, inner canthus; there was a little congestion about the lids, and I remarked that he appeared to be getting into trouble. The next day the eye was closed, lids swollen. I asked him to blow his nose and he grabbed hold of it and gave an exhibition that sounded like a trombone. I am satisfied that is the way he started his present trouble, forcing the infection through the paper plate; and he is in for serious consequences, possibly an operation.

**Rare Localization in Osteochondropathy.**—Dubrovskaya describes an observation in which the diagnosis, after roentgenography of the 12 year old patient, was neoplasm of the proximal end of the fifth metatarsal bone of the left foot. The right foot showed similar but less intense changes. The author states that the change in the left foot was the result of a pathologic fracture of the necrotic bone with subsequent spreading of the necrosis. In the right foot the spread of the necrosis took place without a previous fracture.

## CLINICAL ASPECTS OF TUMORS OF JAW AND PALATE\*

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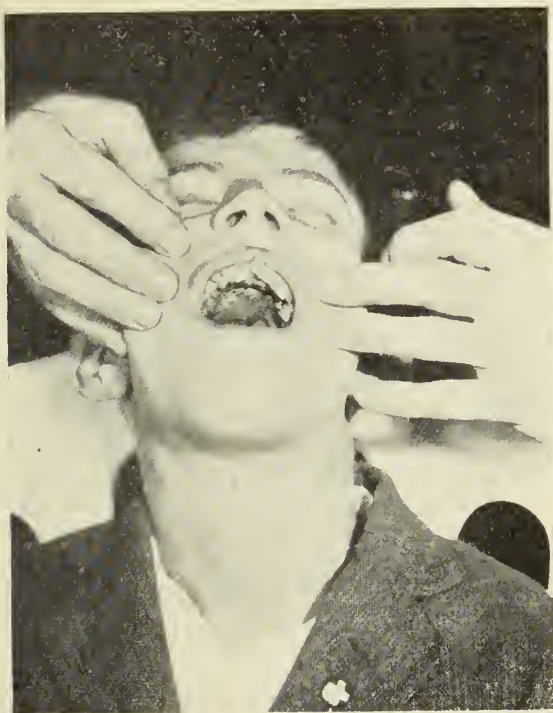
Since the earliest days of medical science the various aspects of malignant and benign tumors have assumed an important role in progressive medicine. This is particularly true of the malignant types. The medical scientists endowed with persistent enthusiasm have struggled to bring to life new facts concerning these maladies, while the clinician, grasping each new theory, has put forth inexhaustible effort to combat these diseases. To most of us the sum total of this toil appears to be of little value when estimated in terms of real service to our patients, for we have frequently watched our earnest and well directed efforts ruthlessly cut by malignant advance and in the face of numerous failures have lost our desire to continue as eager experimentalists. To one endowed with a practical sense of value, however, comes the feeling that within the last decade research and experimentation, advance of pathology, and advent of the more highly trained oral surgeons, have brought forth measures which occasionally control, if not actually eradicate, malignant diseases. I use malignant diseases to indicate malignant growth of cells as well as growth of tumor which is malignant by position.

It is doubtful if the laryngologists as a whole have kept pace with the medical and surgical progress as regards malignant disease of the jaws. They have long realized the serious nature of malignant diseases of the jaws and the hazards tending its treatment and have stopped short of complete eradication or passed their cases on to the x-ray and radium expert, that they might give their attention to phases of the specialty productive of a more satisfying result. The writer realizes that the concrete achievement of this paper fails to disclose any new discoveries. Its only justification perhaps lies in the fact that it brings before you an old subject of no little importance to the laryngologist with a review of some cases and clinical data which may be of some little service in the diagnosis and treatment of tumors of the jaw and palate.

Tumors of the jaw have been recognized for almost a century to be of dental origin. The publication of Broca, in 1869, on odontoma. This was followed by Mallisiz, in 1888. Borst, Heath, Steensland, McCarty, 1918, and lastly Bloodgood, who gave us a

\*Read before the Eye, Ear, Nose and Throat Section, Kentucky State Medical Association, Louisville, 1932.





Granuloma Pyogenicum

great deal of the pathology. It is a rather surprising fact that a small amount of literature has been written on this subject in the past 50 years. A great deal has been published on carcinoma of the jaw with very little which would indicate our advance into the inroads of this disease. Needless to say that it would be impossible for one to cover this extensive subject in so short a time. I wish to review a few of the cardinal points of the diagnosis and treatment of the different types of tumors of jaw and palate.

Epulis may be fibrous or giant-cell in type. These tumors arise in the periosteum or connective tissue beneath the mucous membrane. They arise on the gum or alveolar ridge. It is a tumor of young adult life and occurs more frequently in females. The fibrous type when removed rarely returns. The giant-cell, unless completely removed with periosteum, will recur and may become malignant. The prognosis in general with these tumors is good but one must remember that they may become malignant.

Sarcoma. This is a malignant new growth of connective tissue tumors, most often found in bone. It may arise from bone marrow, blood vessels of bone or from periosteum. These tumors are grouped histologically according to predominance of cell, either a giant-cell, spindle-cell, or round-cell type. The rate of growth depends on the predominance of the type of cell, the giant-cell being the least malignant and the round-cell the

most malignant. These tumors are found in youths and young adults. The central type is usually a giant-cell and as it grows it causes softening of the marrow and absorption of bone. When it reaches the periosteal covering this expands and forms a bony capsule. The soft tissue is never invaded unless this capsule breaks. The periosteal types arise from periosteum and surround the bone and only slightly involve the bone itself. These are painless in their growth and are of mixed type, spindle-cell or round-cell type and are the least malignant of these types of tumors Chondrosarcoma, which occurs most frequently in the upper jaw, the osteosarcoma which may rise in either jaw. The fibro, and myxo types show a tendency to malignancy upon recurrence. The round-cell types are very malignant, are soft in consistency and show rapid growth and usually arise in the antrum. Trauma is an important etiological cause of sarcoma. It is an interesting fact to note if recurrence is to appear, it usually recurs within six to twelve months. The prognosis depends on the type of cell and as to whether it is located in the upper or lower jaw. Recurrence is more apt to occur in the upper jaw.

#### BENIGN TUMORS

Fibroma arises from the marrow of the bone itself, either connective tissue or from blood vessels. It occurs most frequently during the third decade of life. These may attain great size, may be of central or periosteal origin. The cause is not known and they are usually of slow growth. The symptoms that arise are usually due to pressure. It is very frequently located on the lower jaw, does not metastasize and it can be removed entirely.

Chondromas are very rare. They are thought to arise from cartilage cell rests, may be benign or malignant in character. The benign type is composed of pure hyaline cartilage and sometimes is mixed with connective tissue. For example, the fibro-chondromas. The malignant type contains sarcoma elements, chondro-sarcoma and the osteo-chondro-sarcomas. These tumors do not infiltrate sound tissue. They destroy by pressure and usually arise from the alveolar margin or from bones of the face, orbit, vault, or the palatine plates. These tumors usually occur under the age of twenty-five. The growth is usually slow, may attain great size, rarely ulcerates. Recurrence may occur a long time after operation. One must remember that there is a great tendency to malignant change upon recurrence. Complete removal is essential.

Myxoma is pure type, is very rare. It is usually combined with a sarcoma element and the myxomatous nature of the tumor it-

self suggests a very radical operation.

**Lipoma.** Only three cases of lipoma have been reported.

**Osteoma** may arise from preformed bone, cartilage, connective tissue or periosteum, usually occurs before the twentieth year and is usually bilateral. Bilateral occurrence of these lesions suggests a possibility of congenital origin. X-ray is a great deal of assistance in the diagnosis of these tumors. These tumors may arise in any of the sinuses. Complete removal is possible.

**Odontoma.** These tumors arise from portion of tooth follicle. The particular histopathology is characterized by the particular development of cells of follicle from which the tooth arises. They are classified:

1. Dental root cyst.
2. Follicular or dentigerous cyst.
3. Compound or composite follicular cyst.
4. Adamantine epithelioma.
5. Hard odontoma.

Adamantine epitheliomas arise from the erratic development of certain cells of the enamel organ. A number of synonyms have been used: odontoma, epithelial cystic carcinoma, adenocarcinoma (multilocular), and cyst adenoma of the jaw. These tumors are not uncommon and are most often dentigerous cysts. They arise from the embryonic epithelial remains of the tooth germ, the enamel organ. These tumors are very benign in character. They are the most benign of the epithelial tumors of the jaw. They appear in young adults and are more frequent in the male—most likely occur in the lower jaw and when it occurs in the upper jaw is usually near the angle in the region of the molar tooth. These tumors vary in size and are relatively slow growth. The pain present depends upon the rapidity of the growth and position. The pain is entirely due to pressure on the nerve trunks. The tumor itself is not movable and the surface is irregular due to the cystic make-up. Some of these tumors, however, are solid types of tumors. The mucous membrane is normal over them in appearance. The lymph glands are rarely involved unless ulceration occurs and secondary infiltration. The surface crackles on palpation and the teeth adjacent to the tumor are irregular and very often loose. The prognosis is good but it is necessary to do a complete removal of the tumors.

**Cysts of the Jaw.** (1) They may be follicular or dentigerous (2) the root cysts. Dentigerous cyst is not an uncommon form of benign odontoma. This type of tumor occurs most frequently in the lower jaw. It rarely occurs during the period of the first teeth and when it occurs during the period of the second dentition is usually arises from the wisdom teeth. The growth is slow

and it advances along with new growth of bone so that the bony wall is in an expansion of the previous bony capsule but the shell of the bone is formed over the advancing tumor. These attain great size when in the upper jaw and are accompanied with very little pain. The mucous membrane is very rarely ulcerated. The molar teeth and canine teeth most often missing with the development of these cysts. It is felt that these tumors arise from the overgrowth of some part of the follicle of a non-erupted tooth. These tumors may have any parts of the tooth in them. X-ray is very helpful in the diagnosis of these tumors. Operative treatment consists of complete removal of the cysts.

The Root Cysts are the most frequent form of cysts of the jaw, never associated with the first teeth and are more frequently located in the upper jaw. They are distinguished from the dentigerous cyst in that the latter are in the lower jaw and associated with the molar teeth. Usually the walls are lined with granulation tissue and epithelial cells. Origin of root cyst—the patient has first a peridontitis and as a result granulation tissue develops. A softening then occurs with the development of a cyst.

**Compound Follicular or Composite Odontoma.** These tumors are composed of varying combinations of several tissues of growth of tooth follicle. They may contain fibrous tissue, cysts, bits of enamel, dentine or cement. They may attain great size.

**Hard Odontoma or Cementomas.** These tumors are very rare, are very hard in consistency and it is necessary for complete removal for cure.

**Carcinoma of the gum** is more frequent than sarcoma. It is more frequently found in men. It usually occurs in the fourth decade of life. The etiology is not definitely known but it is felt that chronic irritation is a contributing factor. The pain depends upon the location of the lesion. Its course is very rapid and the prognosis is very grave. Carcinoma arises from the soft tissue and then invades the bone. Carcinoma of the lower jaw metastasizes sooner than the upper jaw. Only about 5 per cent of the cases are cured. Carcinoma of the antrum is the most frequent site of this tumor, then the middle turbinate and lastly the alveolar ridge.

With as poor a prognosis needless to say that an early recognition of the disease with the institution of radical measures offers one the best possible chance for cure.

In conclusion one may summarize in general the few things essential to aid in the diagnosis and treatment of these diseases. The history is of prime importance, age incidence, sex, the place of origin, the rate



of growth, the jaw involved, and lastly the character of the tumor. Very close perusal of these cardinal points will aid one materially in early diagnosis and proper treatment of these tumors.

#### CASE REPORTS

1. Dennison, J. C. Age 70, male. Tumor lower jaw (carcinoma). Ten to twelve months duration. Consulted physician first time 10-12 months after onset. Radium treatment—no result.

2. Anderson, Mrs. G. Age 65. Epithelioma upper jaw, three months duration, very extensive. Radium treatment—no result.

3. Hazelwood, Mr. T. Age 43. Lues. Squamous cell carcinoma upper jaw and mouth. Radium—Death.

4. Ross, George. Age 60. Carcinoma mouth—gland in neck. Removal of gland and carcinoma of mouth. Radium—Died six months.

5. Schwartz, Henry. Age 57. Sarcoma lower right jaw. No treatment.—Died.

6. Stevenson, Precia. Age 29. Adamantoma upper jaw (hard). Surgery—no improvement—Died.

7. Campbell, Willie. Age 27. Sarcoma (central giant-cell) of mandible. Curettment and excision of tumor. Unimproved.

8. Davidson, Mrs. H. Age 51. Adenoid cystic basal-cell carcinoma of nose with generalized metastasis. Two years duration. Excision and cauterization. Died two years later.

9. Werle, Nell. Age 36. Carcinoma left antrum and jaw. Five months duration. Radium—died eight months later.

10. Patton, Willie. Age 23. Adamantoma left lower jaw. History of 11 years duration. Operated upon 1921-1924 with recurrence. Resection of jaw done 1928. Condition good now.

11. Cuddy, Mrs. James. Age 23. Osteochondroma sarcoma. Three years duration. Operated upon three times with recurrence. 1930 re-operated upon—resection done with no recurrence two years.

12. Davis, Mr. Flint. Age 66. Epulis jaw upper (giant-cell). Excision and cauterization. No recurrence two years.

13. Cecil, Mrs. C. W. Age 69. Epithelioma upper jaw, nose and cheek. Eight months duration. Radium—died.

14. King, Mary. Age 13. Fibroma sarcoma upper jaw (small) Excision and cauterization. No recurrence five years.

15. Carter, Master Charles. Age 10. Hemangioma left cheek—lip Sarcoma. Never returned for treatment.

16. Higgins, Brisk. Age 40. Adamantoma upper jaw, left. Excision and cauterization. No recurrence one year. No history obtainable after this.

17. Coke, Mr. J. S. Adamantoma (multifocal cystic tumor right lower jaw). Radium—no recurrence one year later.

18. Corman. Age 8. Granuloma pyogenicum hard palate. Six months duration. Excision cauterization—no recurrence eighteen months.

19. Buford, Wm. Age 54. Carcinoma epidermoid left upper jaw. X-ray—Radium—Still living.

20. Irvine, J. T. Age 63. Fibroma with secondary carcinomatous change. Two years duration. Excision—good result.

21. Peel, Mrs. Clarence. Age 48. Chondrosarcoma of left parotid. Tumor removed in 1916 first operation; 1928 second operation; 1930 third operation.

#### DISCUSSION

Claude T. Wolfe, Louisville: When Dr. Yates wrote me requesting that I open the discussion on his paper it was only after much hesitation that I consented. I have always been willing to refer patients with malignant tumors of the jaw to oral surgeons or the Roentgenologist, and when I look back at the comparatively few cases I have seen I hesitate to criticize myself in this respect as, with few exceptions, the results obtained were quite discouraging.

Dr. Yates has shown no hesitancy in attacking these new growths, and while in the majority of instances he has been unable to rid the individual of all traces of their presence, he is to be congratulated upon his efforts.

In my experience, new growths of the jaws are uncommon but their infrequency should in no way lessen our responsibility. It, therefore, behooves us to get all the information we can on these tumors.

The effective treatment of malignancy as observed in my line of endeavor comes rarely except in its early recognition. This point is particularly stressed by the essayist. On the contrary early malignancy is difficult to diagnose.

While research workers everywhere are putting forth their greatest efforts to discover the cause of malignant disease, their results so far are disappointing. It therefore, is obligatory on the part of the surgeon and the Roentgenologist to carry on until the cause is isolated and a specific found.

Medical literature cites many cases of sarcoma that are directly attributable to trauma, and the essayist gives it credit as an important etiological factor. I am wondering if the types or degrees of trauma can be classified in any way so as to enable us to prognosticate the probability of the occurrence of a sarcoma?

The essayist in summarizing his points of diagnosis omitted several symptoms which I have noted, e. g., enlargement of the cervical glands and cachexia in advanced stages. In the

differential diagnosis, syphilis and tuberculosis should always be eliminated.

I feel that all of us have profited by this most excellent and beautifully written paper. To attempt to discuss it further would be superfluous and but repetition, as the subject has been covered in a most thorough manner.

**Wm. P. Drake, Bowling Green:** Most of the tumors of the nose and jaw that are malignant are sarcomatous in character. We do not know a great deal about the cause of cancer at present. The theory of heredity seems to have been more or less exploded; nevertheless, I am inclined to believe that it plays a most important part. Irritation is supposed to be a considerable factor but, on the other hand, if that were true, most of us would have developed cancer from shaving. I think malignant growths are simply inborn—a process of evolution as it were. If we can cut off the tails of rats and finally breed rats without tails, why can we not by some process establish an immunity to cancer in human beings that will pass from parents to children? We cannot get around evolution.

One thing that I think is rather important in connection with tumors of the jaw is that they should never be opened for the purpose of obtaining sections for microscopical examination unless the patient consents to immediate operation; in fact, some authorities say it should never be done; that we should go ahead and operate and then make sections.

Another thing, we should not be misled in our diagnosis by enlargement of the gums during gestation. There is apt to be considerable enlargement of the gums during that period which if we are not careful may be mistaken for a malignant condition.

**R. W. Bledsoe, Covington:** If I had heard only this one paper I would have felt that I had been fully justified in coming down here to attend this meeting.

The conditions upon which the essayist has so ably elaborated are not commonly met with, and having heard his paper will certainly stand us in good stead in the future when we run across such cases.

I am particularly interested in the subject because of a case which recently came under my observation in a woman, 47 years old, whom I first saw some four or five years ago, at which time she gave a history of having had a right lower wisdom tooth extracted some eight years previously, and at the site of the tooth there had developed a considerable mass which, however, had not broken down; there was no suppuration. A dentist had x-rayed her and found the mass and asked me to look at the picture. It so happened that I had known the patient since girlhood; therefore, after the dentist had thoroughly curetted the mass I had her come to see me. There was a big hole in

the inferior maxilla on the right side which appeared to be healing up all right. I did not see her again until about a week ago, when she came to my office with a history of having gone from doctor to doctor in Covington and Cincinnati, and each successive one scared her more than the preceding one. One wanted to take out her jawbone; another wanted to do this and another that; one said it was malignant and the other said it was not. Upon the advice of an acquaintance she had gone to Nashville and some doctor there had curetted the whole thing out and promised her a complete recovery. I am wondering whether it is going to be a complete recovery or complete recurrence. I believe she will eventually end up in Dr. Yates' hands. Before she was operated upon the last time her jaw extended far out and the mass on the inside pressed the gum beyond the median line so that it was difficult for her to eat. All the teeth on that side are out—both upper and lower. At the present time she can eat well enough but there is quite a hole in the inferior maxilla, with a small sinus not larger than a lead pencil.

**A. L. Bass, Louisville:** I would like for the essayist in closing to discuss the value of the x-ray and radium in the treatment of malignant conditions of the jaw.

**Wm. P. Drake, Bowling Green:** Just one more word. Radical as it may sound, I am convinced that non-malignant tumors or growths never become malignant, regardless of any operation or manipulation; if they are not malignant in the beginning they do not become so.

**E. C. Yates, (in closing):** I wish to thank you gentlemen for your kind discussions of this paper. As regards Dr. Bass' question as to the use of x-ray and radium in the treatment of malignant tumors of the jaw I might state that various opinions have been offered as to the results obtained by such treatment. We know in general that the more cellular the structure of the tumor, the more sensitive it is to radium. Various radium collars and other applicators have been devised for application to these tumors. In general the opinion is, however, that the x-ray and radium treatment is mostly palliative.

As regards the statement that a benign tumor never becomes malignant, this is certainly not borne out by experience. One must remember that although benignancy is the rule, malignancy may occur. The percentage of cures in these cases of tumors of the jaw, particularly with reference to the carcinomatous group, is approximately 5%. The primary purpose of this paper was to stress the importance of early diagnosis and sufficiently radical excision. We are too prone to get the patient off the table in order to save life at the expense of doing a sufficiently wide excision and cauterization of the tumor. Patients are not uncomfortable following resection of the jaw if the jaws are fixed in complete occlusion following excision.



LOCAL TEMPERATURE STUDIES IN  
DISEASES OF THE EAR, NOSE,  
AND THROAT\*

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Louisville.

In this paper I will not enter the subject of thermogenesis, the source of body heat,—thermotaxis, the regulation of body heat,—nor the subject of thermolysis, heat dissipation, but only the significance of local temperature in diseases of the ear, nose and throat, and its relationship to diagnosis, prognosis and treatment.

I wish to mention in passing the variation of the temperature in different parts of the body and some factors physiologically influencing such variations. Various parts of the body eliminate heat in amounts corresponding to the intensity of their metabolism. Muscle tissue is classed first then glandular, and then nerve and connective tissue. Heat thus produced is transmitted from part to part, the final absorbing medium being the blood, but since the blood cannot equalize the temperature instantaneously, some parts of the body must be warmer than others. For example the temperature of the skin near the large vessels will be higher than a part further removed.

Fluctuation of body temperature is not uncommon. Some of the factors causing such changes are age, sex, time of day, food, exercise, season, climate, clothing, race, and of course, various constitutional and local febrile conditions.

In the process of temperature recording the parts in relationship to the thermometer is of importance, along with the type of tissue upon which the thermometer is placed, as well as the proximity of the thermometer to that tissue. For example, rectal temperature is higher than oral, and the latter correspondingly higher than axillary. Also, for obvious reasons, oral temperature with the mouth open is lower than if the mouth were closed.

As elevation of temperature is essentially due to some inflammatory condition, I will briefly review the processes of inflammation and the cardinal symptoms thereof.

The four cardinal symptoms of inflammation are first: Calor, or increased heat due to hyperemia and an increase of the metabolic rate. Second, rubor, due to increase of circulation, and third, dolor, which is pain due to bacteria and to the action of bacterial toxins on the sensory nerve endings, and to the pressure of increased blood supply and exudates. Fourth, we have tumor, which is caused again by the increased amount of blood to the part, as well as by exudates and

migratory cells. A fifth cardinal symptom may be added, namely, loss or altered function, and this may be caused by any of the previously mentioned cardinal symptoms.

The general body temperature is elevated if inflammation or infection is extensive, severe, or deeply seated, but in this discussion I am essentially interested in local temperature, and only in general temperature in a comparative sense.

I might mention here in passing that some patients because of lowered body resistance, or because of an overwhelming infection, or for some vague physiological reason do not easily "make" general body temperature, although the local infection may be virulent and cause high local fever. Such patients are definitely to be taken into consideration in this type of study, and a history of "rarely having temperature" can often be obtained from these patients. Specific immunity may also play a part in these types of individuals.

Acute or chronic septic conditions of the aural and upper respiratory tract, or at any site in the body, causes heat to be generated, and such heat is passed on by continuity or by conduction to the surrounding tissues. Since general body temperature arises from such a local source, that is from bacteria or bacterial toxins from such a local source, it may logically be assumed that the local temperature will be greater than the general or oral temperature due to the extensiveness of the local inflammatory reaction. There are some exceptions to the latter statement as in severe streptococcic and tetanus infections where the primary portal of entry often cannot be demonstrated. These conditions are so comparatively rare, and play such a small part in diseases of the ear, nose and throat, that I shall not consider them here. The fact that local fever at the site of an infection will ordinarily be higher than the oral temperature which it causes may be assumed to be true not only of the ear, nose and throat, but of any infected area of the body which gives rise to fever, and the same conclusions may be drawn from the recording of temperatures of such local areas of infection as may be drawn from the records of local temperatures in diseases of the ear, nose and throat.

I have found the following to be true by a study of the ear, nose and throat local temperatures in normal patients.

First, in 54 normal cases the average aural temperature was one degree lower than the normal oral temperature of 98.6 degrees. In 40 normal cases the average infratympanic temperature was 2.2 degrees under oral temperature, and in 18 normal cases the average intra-antral temperature was 2.8

\*Read before the Eye, Ear, Nose and Throat Section, Kentucky State Medical Association, Louisville, 1932.

degrees under oral. All temperatures were taken bilaterally with the exception of the antral which will be explained later. The variation of the above temperatures as mentioned before may be said to be due chiefly to the nature of the tissue upon which the thermometer rests as well as its proximity. Temperature records of normal ethmoids, frontals and sphenoids could only be recorded by the before mentioned infraturbinate readings of 2.2 degrees below oral. In all normal cases the temperature of the inferior and middle meati varied on the average of .1 of a degree, being higher to that extent in the middle meatus. Since this variation was so fractional it was essentially disregarded, but its cause may be said to be due to the proximity of the thermometer to the tissue, and to the fact that the region under the middle turbinate is comparatively more vascular and more easily involved in disease processes due to the anatomy.

The throat temperature under normal conditions was found to be equal to the oral temperature.

Just a few words here as to technique. In recording all the temperatures of the ear, nose and throat, the oral temperature was first noted. For the recording of ear temperatures various size thermometers were obtained of the rectal type varying from 17 to 24 M. M. in circumference. The ear canals were cleaned and the mercury column shaken down to 95 degrees. The thermometer was then placed as far as possible into the meatus, the bulb directed toward the drum till the sides rested against the sides of the external auditory canal. Essentially an air tight chamber was formed between the bulb and the drum. The bulb should not rest on the drum, neither should it be too far away from the site to be tested. For this reason various sizes of bulbs were required. The thermometer was allowed to remain in place for 5 minutes, both in the ear canals and at all other sites to be mentioned later with the exception of the nose, where it was left in contact with the tissues for 10 minutes. Bilateral temperatures of the ears were always taken, and of all other parts whenever possible.

As regards readings of the nose, thermometers of various gauges were obtained, so whenever possible they could be inserted under the middle and inferior turbinates after being depressed to 93 degrees.

Intra-antral records were obtained in those cases which had made a complete recovery following acute or chronic maxillitis, such recoveries being proven by x-ray as well as by clinical examination, and from antra during active diseased conditions. In the cases where a window opening had been made

through the inferior meatus, the thermometer was inserted through this opening. In other cases the thermometer was inserted through a cannula following a puncture for irrigating purposes, while in a few cases it was possible to insert a narrow thermometer into the antrum through the cavity left by the extraction of a tooth.

It was thought satisfactory to study increases of temperature which were due to frontal, ethmoidal and sphenoidal disease by merely taking the infraturbinate readings, especially since this seemed the only method possible.

As regards the temperatures of the throat, and here I refer essentially to tonsillar and pharyngeal infections, the thermometer was placed in close relationship to the tonsils whenever present,—either into the substance of the tonsils, between the lobes, or between the anterior pillar and the tonsil, and with the mouth tightly closed. Essentially the thermometer was placed in close relationship to the noted pathology or the part to be tested.

In febrile conditions other than of ear, nose and throat origin the thermometer readings of the ear, nose and throat will be in the normal proportion to the oral temperature as before stated. For illustration, if a patient has an acute attack of appendicitis with fever of 103 degrees and with a normal ear, nose and throat, the aural temperature will be 102 degrees, one degree lower than oral; the infraturbinate temperature 100.8, or 2.2 degrees lower than oral; the intra-antral temperature 100.2 degrees or 2.8 degrees lower than oral, while the throat or tonsillar readings will be the same as the mouth, namely 103 degrees.

Let me state again that this paper is only of a general comparative nature. Not a great amount of clinical material was available, and little literature could be found related to this subject. No miraculous claims are made for the thought as presented. The purpose is only to draw attention to what is thought to be a rather new application of an old diagnostic instrument—the thermometer, and to whatever aid it may have in the diagnosis, prognosis and treatment of ear, nose and throat conditions.

Various handicaps were encountered in obtaining different sizes of thermometers; suitable clinical cases, and whenever such a suitable case presented itself from a standpoint of proven diagnosis, it was not always possible to properly insert the thermometer so as to obtain proper and correct readings.

It was found that the use of adrenalin or ephedrine under the middle of inferior turbinates before the insertion of the thermometer caused a lowering of the readings ob-



tained, so all records were kept only of those cases where a thermometer could be placed into the middle or inferior meatus without first shrinking the turbinates.

Nasal temperature was found to be closely related to nasal respiration which in turn is dependent on the width and length of the nasal duct, also on the size and form of the turbinates, the position of the nasal septum, and on the size of the naso-pharynx. In persons having impaired nasal respiration the nasal temperature was found to be elevated, even equal to oral, the degree of elevation depending upon the extent and nature of the obstruction.

The irritation caused by the introduction of the thermometer into the healthy ear, nose and throat is to be considered as the thermometer will of course act as a foreign body and in itself cause some inflammatory reaction and therefore increase in temperature which I know of no definite way to record. The amount of this inflammatory reaction will be very slight due to the short time the thermometer is left in place, and therefore only fractional elevations of thermometer readings will result, which may be eliminated from consideration. In addition, the elevation brought about from this cause will be bilaterally equal.

With your indulgence, I shall go briefly into a more detailed practical clinical aspect of the application of the ideas as presented.

First, we shall consider the ear. Thirty-eight cases of various types of ear diseases were studied in relationship to temperature, of which several typical cases will be cited.

In the first case the patient presented herself with a typical case of acute purulent otitis media, with impaired hearing, pain, and a red bulging tympanic membrane on the right. The oral temperature was 102 degrees. The right ear temperature was 102.8 degrees and the left ear 101 degrees. The nasal and throat temperatures were in their normal ratio to the oral. This of course, is a typical case where a myringotomy was performed with prompt recovery. Many cases are not so outstandingly typical, and in such doubtful cases the aural temperature may play a large part in the diagnosis and prognosis, and therefore in the nature of the treatment.

The second case is that of a child upon whom a simple bilateral mastoidectomy was performed following acute bilateral otitis media. The oral temperature at the time of operation was 104 degrees. The right ear temperature was 104.6 and the left 104.8. On the fourth post-operative day the oral reading was 99 degrees, the right ear 98.8 and the left 99 degrees, with the general condition of the patient satisfactory. On the eight post-

operative day the oral temperature was suddenly elevated to 105 degrees with chills. Blood cultures were at once obtained but the results were necessarily delayed twenty-four hours. The other usual diagnostic procedures were resorted to, among them being the Queckenstedt test which was negative. At the same time this test was done the mouth temperature was 105 degrees, the right aural 105.8 and the left 104.3 degrees. While I felt certain from this temperature record that I was dealing with complications in the right ear and mastoid, the patient was symptomatically treated for twelve hours and at that time the Queckenstedt repeated. The test was now positive on the right, and a secondary operation was done at once. A large clot was removed from the right lateral sinus.

Here the value of the temperature readings was unquestionable, and showed the site of disease extension before the positive Queckenstedt was obtained. This was likely due to the fact that at the time of the first spinal manometer test only a partial occlusion of the vessels of a phlebitis existed which gave no appreciable difference in the manometer readings, yet by the extension of the inflammatory process caused increased local heat.

The third case was one of typical right acute purulent otitis media. The mouth temperature was 101, the right aural 101.6 and the left 100.2 degrees. The nasal and throat temperatures were in the normal proportion to the oral. The left drumhead was normal, the right, red and bulging. A myringotomy was at once performed on the right, followed by profuse, purulent drainage. The drainage gradually subsided till the sixth day, at which time the ear canal was only slightly moist, the perforation healing, the oral temperature 99 degrees, the right ear 98.6 and the left 98.2. On the twelfth day the oral temperature was 103 degrees. The ear was dry and the perforation healed, although the drum was slightly pinkish, but not bulging, and had not regained its normal lustre. The question of re-involvement of the ear and mastoid arose. The temperatures of the ears were now taken and compared to the oral temperature of 103 degrees. The right ear was 102.2 and the left 102.1, approximately one degree under mouth temperature. Therefore, I felt no ear complications existed in this case. A laxative was given and the following day the aural and oral temperature readings were normal.

In this case it would have been logical to assume re-involvement of the infected ear, but this was ruled out in part by the temperature findings. Had the aural temperature equaled or exceeded the oral, ear disease

would have been deemed present and adequate surgical treatment instituted.

Dr. B. M. Becker in the Archives of Otolaryngology, vol. 11, No. 2, Feb., 1930, says: "In acute ear disease with or without constitutional pyrexia ear temperature equals or exceeds mouth temperature." "Therefore, if aural temperature equals or exceeds oral temperature, we are dealing with ear disease."

Obviously, in non-inflammatory diseases of the ear, temperature readings have no significance. The entire idea of the value of local temperature is founded upon the heat caused by the local inflammatory reaction which is, of course, not present in non-inflammatory conditions.

A case of chronic catarrhal otitis media showed oral temperature of 98.6, with ear temperature of 98.5 on the affected side and 97.6 on the normal side.

A case of chronic purulent otitis media of years duration showed oral temperature of 99 degrees, a temperature of 98.8 in the diseased ear, and 98 in the normal ear.

Another similar case of chronic purulent otitis media showed oral temperature of 98.8 degrees, right diseased ear 99 and left normal ear 97.6 degrees.

It may be said that in chronic conditions of the middle ear in which there are marginal perforations of the drum showing bony involvement, the aural temperature is slightly higher than in chronic conditions of the middle ear showing central perforations.

It must be mentioned in passing that there are various conditions of the external ear and canal as well as of the tympanic membrane which will cause the aural temperature to equal or exceed the mouth temperature. However, such conditions as erysipelas of the external ear and canal, furunculosis, myringitis, and various forms of trauma, which would increase the aural temperature by causing inflammation, are usually easily diagnosed, and may therefore be eliminated as factors confusing the interpretation of the temperature readings.

We may say generally that prognosis and severity have a definite relationship to the ratio between aural and oral temperature readings within normal limits. The greater the aural over the oral temperature the graver the prognosis and the more acute the condition.

I cannot be definite about this latter statement as my observations do not extend over a sufficient period of time, nor have sufficient number of cases been studied, but I do feel in a general way that the most severe cases showed a greater variation in oral and aural temperatures, except in those cases of a definite chronic nature, which could be classified

as of a dangerous type, but which showed only slight temperature variations. However, if such a chronic case became acute the temperature ratio greatly increased.

In passing I would like to call attention to the fact that the thermometer may be placed in the post-operative mastoid wound directly whenever complications are suspected. My clinical experience along these lines has not been extensive enough to merit report. It seems logical though, that much valuable information could be derived from this source.

As stated before, temperature readings of the throat, that is with the thermometer in contact with the tonsil or part to be tested, are normally the same as oral, using the technique previously described. Forty-two cases of tonsillar and pharyngeal infections of various types were studied. In tonsillar and pharyngeal infections, readings varied from .1 to .4 of a degree higher than oral. The more acute the case the greater the variation, and here again I feel the greater the ratio the more serious in every way the infection.

The temperature findings of the throat seem of some value and importance in the determination of "low-grade" infections, chronic in nature, and in the diagnosis of "border-line" cases.

I. M. Krukower, in the Aug.-Sept., 1929 issue of the Monatschr. f. Ohrenh. (Monthly Journal of Diseases of the Ear) has studied a series of 70 sinus cases. He states that the severity of the infection is directly proportional to the intra-nasal temperature, and the duration inversely proportional. Krukower finds the average normal nasal temperature taken under the middle and inferior turbinates to be 97 degrees or .6 of a degree higher than my average. Geographical and racial factors may play a part in this difference, as well as difference in the methods of insertion of the thermometer, along with the various other factors influencing body temperature as previously mentioned. Krukower also finds no difference between the temperatures in the middle and inferior meati, whereas my findings vary on the average of .1 of one degree.

The infraturbinate temperature as stated before was found normally 2.2 of a degree under oral temperature, or 96.4 considering 98.6 to be the normal oral reading. In this series of 28 cases various types of nasal and sinus diseases were studied. From the data obtained from these studies I have concluded that in sinus disease as well as in diseases of the nasal passages, the normal ratio between the oral and nasal temperatures is altered, the nasal temperature more closely approaching the oral, the nasal temperature being higher on the side involved or the side more



acutely involved. I think the same statement in relationship to the temperature ratio holds good here as in the ear and throat, as in acute sinus and nasal cases the infraturbinate temperature is greater in comparison to the oral temperature than in chronic cases, although this is also dependent upon the degree of severity of the infection, specific immunity or resistance, duration, and to the amount and type of inflammatory reaction. I wish to add here that the results of comparative temperature studies of the sinuses and nasal passage do not give as much definite information as obtained by similar studies in relationship to the ear.

No records for obvious reasons, were kept of direct temperature readings of the unoperated sphenoids, frontals and ethmoids, and in addition turbinate records seemed to give the desired information. It is however, possible to record readings of these sinuses directly by placing the thermometer in their cavities following surgical procedures which will allow for the introduction of the thermometer.

In closing I wish to give the temperature findings in several different types of sinus diseases which have come under my observation.

The first case is one of acute right frontal and ethmoidal sinusitis. The oral temperature was 101. The right middle infraturbinate temperature was 100.2 and the left 98.8 degrees. The readings under the inferior turbinate were .2 of a degree under the middle meati records.

The second case was one of chronic right ethmoiditis. The oral temperature was 98.8. The right infraturbinate temperature in the middle meatus was 97.4 and the left 96.4 degrees. The inferior meati records were .1 of a degree under the respective middle meati temperature.

The third case was one of acute left maxillitis with oral temperature of 102 degrees. The left middle infraturbinate was 101, and the right middle infraturbinate 99.7. In this case the temperature under the left inferior turbinate was the same as under the left middle turbinate, while the readings of the right inferior meatus was .1 of a degree lower than that of the right middle meatus.

The last case is one diagnosed as chronic left maxillitis, and in which a window opening was made into the antrum through the medial antral wall in the inferior meatus. The temperatures before irrigation and treatment were as follows: Oral 99 degrees. Left middle infraturbinate 97.2. Right middle infraturbinate 96.8. Intraantral left 97. The temperatures under the inferior turbinates were .1 of a degree lower than the readings taken under the respective middle turbinates.

Following treatment and full recovery, the temperature readings were as follows: Oral 98.8 degrees. Left middle infraturbinate 96.6. Right middle infraturbinate 96.4. Intraantral left 95.9, and the temperatures under the inferior turbinates were the same as those of the respective middle meati.

In all the various sinus cases in which there was no involvement of the ears or throat, the temperature of these latter parts were in their normal ratio to the oral temperature.

In conclusion I wish to mention that especially in ear, nose and throat conditions it is conceivable that the variation of the temperature ratios between the mouth and the local diseased area during the course of that disease will give some information as to the progress of the infection or its cure.

I wish this paper to be considered only in the nature of a preliminary report. Much data is still to be obtained and studied in relationship to symptoms, diagnosis and course, and to the specific case in all its various aspects before definite statements can be made, and conclusions drawn. I trust that the rather few incomplete facts brought out may add a bit to our present knowledge of ear, nose and throat diseases, and be of some value in diagnosis.

#### DISCUSSION

**Walter Dean, Louisville:** Dr. Victor's paper is very practical and its results may be far reaching. If for instance in a double mastoiditis, there arises thrombophlebitis of the lateral sinus of the intra-venous type, we must positively diagnose which side is affected. This has heretofore been most difficult. Difficult because both lateral sinuses look normal externally and because the Queckenstedt Test is not invariably indicative or reliable. The proper decision may mean the life of the patient. If the relative temperatures of the two uncapped sinuses, as Dr. Victor suggested, can designate the infected vein, an invaluable contribution has been made to otology and I welcome the suggestion.

Practitioners unskilled in the interpretation of drum pictures may find a solution in aural temperature. So may we in latent empyema of the mastoid antrum in infants whose drum and mastoid aponeurosis offer no clue to the underlying pathology. Although this subject is quite new to me, I expect to pursue the matter and to congratulate Dr. Victor for his ingenuity.

**S. B. Marks, Lexington:** I wish to congratulate Dr. Victor upon the work he is doing. In this comparatively brief preliminary report he has furnished us with a very valuable diagnostic aid in some of these obscure conditions that we see, particularly about the ear.

**H. G. Reynolds Paducah:** I wish to congratulate Dr. Victor, or any other young man who proceeds to work out something that older

and busier men cannot find the time for. It is such things as this that mark the progress of knowledge in our specialty.

Dr. Victor referred to the Queckenstedt test which we have all been using. The first two or three times I used it I was convinced that it was the finest thing in the world. I had three cases of sinus thrombosis in which it proved to be absolutely accurate. During the past winter, however, a child nine years old, came under my observation with an ear condition following influenza which proceeded finally to a mastoid for which we operated on him. A few days later the child had a convulsion and the question arose as to the cause of the trouble. A Quackenstedt test was made and showed positive involvement of the lateral sinus. We, however, were unimpressed and we did not believe the sinus involved. The child improved somewhat, and a consultation a few days later did not throw any light on the subject. Finally, however, the child's condition reached a point where something had to be done, so we gave him a blood transfusion and then exposed the lateral sinus and found it to be perfectly healthy. Finally we located a temporal abscess which we opened up and the child died in two or three days.

I happened to be in Memphis a few weeks ago and heard someone ask Dr. Ruttin his opinion of the Queckenstedt test and he said you are apt to have too many different positions to absolutely rely upon it.

I do not wish to be misunderstood. There are times when a Queckenstedt test is in order and is possibly a valuable adjunct in conjunction with other diagnostic measures in arriving to a conclusion as to what to do.

**Octavus Dulaney**, Louisville: Dr. Victor has given us a very valuable and practical paper. In the frequent cases of bilateral involvement that we see, where complications arise, I think his system of temperature findings may be of very great value in establishing which side is causing the trouble.

The Queckenstedt test is not reliable in all cases. I certainly wish to congratulate Dr. Victor upon the thorough study he has given the subject, and we should back him up in it by making some study ourselves.

**R. W. Bledsoe**, Covington: I would like Dr. Victor to tell us in his closing discussion whether, in taking the temperature of the canal of the ear he makes it a closed cavity by packing it.

**Wm. P. Drake**, Bowling Green: Dr. Victor has given us something that appears to be very practical; we always have temperatures to deal with in various conditions about the ear. I have two cases of mastoid trouble under observation that are very interesting to me. One of them came to me six or eight weeks ago with a typical history of chronic discharge, etc., and operation was advised and carried out. Five

or six days later, the patient had chills and elevation of temperature. In nopping out the patient's throat I noticed that the jaw was very tender and soon discovered that we had to deal with a furunculosis which was treated and the temperature dropped to normal. Several weeks later, when the ear had completely healed, with no discharge whatever, he came back again with a furunculosis, with chills and elevation of temperature. I mention this case to illustrate that sometimes what we may think is a sinus thrombosis may be due to a furunculosis.

The cases which give me most concern are those which show chronic elevation of temperature. We know that a patient with a low-grade infection of the throat or tonsils will run a chronic mild elevation of temperature, but I am convinced that many of these cases are of tuberculous origin. I have seen a considerable number of such cases, several of which I referred to Louisville men who recommended removal of the tonsils with happy results. I do not think removal of the tonsils is always contraindicated in the presence of tuberculosis; in fact, I feel that we sometimes get better results by removing them. I recall one case in particular that I had under observation for quite a while and finally found tubercle bacilli in his sputum and sent him to Louisville for thorough examination at the Tuberculosis Sanatorium. Dr. Turner reported back to me that if I had not told him I had found tubercle bacilli in his sputum, he would have said that the man showed very little evidence of tuberculosis. His tonsils were removed and he was kept in bed for several months and made a complete recovery.

**Karl N. Victor**, (inclosing): In reply to Dr. Dean's question concerning the relationship of otitis media in infants to intestinal conditions, I wish to say that I feel that ear temperatures give valuable information. In such types of cases mouth temperature may be normal, yet if any inflammatory condition exists in the middle ear, regardless of its relationship to intestinal conditions, this inflammatory reaction will bring about an elevation in aural temperature findings. Any infection in the middle ear will cause inflammatory reaction and, therefore, temperature elevation.

It is interesting to note the advantages of ear temperatures in the hands of a physician not in the habit of diagnosing ear conditions, or one not even having an ear speculum. Several days ago such a doctor, to whom I had previously explained my ideas, requested I see a patient of his and to come prepared to open the right ear drum. Upon my arrival I found an infant, apparently in pain, and having a high temperature. Upon my examination I found both ear canals filled with cerumen so that I was unable to view the drum heads. I asked the doctor how he had made the diagnosis of otitis media, and he stated he had taken the



ear temperatures which he had then compared to the oral, and had found the temperature of the right ear higher by one degree than that of the mouth, while the left ear temperature was two-thirds of a degree lower than the oral. Upon removing the cerumen, the right drum presented a typical picture of acute otitis media, and a myringotomy was at once done.

In regard to the methods of taking the temperature readings I wish to say that the thermometers are not packed into place either in the nose or ear. In the ear, the thermometer is placed in the canal, not in contact with the drum but close to it, and with the walls of the canal closely adherent to the thermometer bulb, so that practically an air-tight chamber is obtained. In the great majority of cases, thermometers of the rectal type ordinarily obtained on the market will be found satisfactory.

In the nose, thermometers of narrow gauges must be obtained and these placed without packing or previous shrinking, under the middle or inferior turbinate or into a sinus.

All local temperatures may also be compared to axillary or rectal as well as oral, making the proper allowance for the site used in the interpretation of the findings.

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**Fat Embolisms.**—Makai reports the clinical history of a man, aged 50, who sustained a complicated fracture of the leg. The fracture was reduced and then fixed with a plaster-of-Paris splint. At first the patient was completely conscious, so that he was able to give orders and to read, but on the following day he became unconscious and restless. This condition persisted for several days, and when on the sixth day he came under the author's observation, a cerebral embolism was assumed and the injured extremity was immediately amputated. The improvement in the patient's condition was so evident after the amputation that a causal relationship can hardly be doubted. This case corroborates Kirschner's theory, who maintains that fat embolism not only develops immediately following a fracture but may develop later as result of incomplete fixation. If more and more fat enters the circulation, the sequelae, especially the cerebral symptoms, increase in severity, but if the source of the fat embolism is excluded the patient may recover. The author thinks that fat embolism may perhaps be more frequently the cause of temporary disturbances after injuries than is commonly believed. He suggests that the bronchopneumonia which so frequently develops in older persons after a fracture may be due to pulmonary fat embolisms. In regard to the treatment he states that, in severe fractures with cerebral symptoms and shock, care should be taken to prevent repeated fat embolisms.

## THE PREVALENCE OF MORAX-AXENFELD CONJUNCTIVITIS\*

GAYLORD C. HALL, M. D.

Louisville.

In July, 1896, Professor Morax first described this disease and demonstrated the causal organism. Immediately thereafter, in August, 1896, Professor Axenfeld, at the Heidelberg Ophthalmological Conference demonstrated preparations of the same bacillus, and elaborated upon the clinical description of the disease. He stated that he considered it one of the most wide spread infectious diseases that exist. Shortly thereafter there came in case reports of the disease from all parts of the world. It was at first considered essentially a chronic infection but later studies discovered the acute form and the complicating corneal ulcers.

The organism itself is a rather large bacillus, 1 by 3 m, that occurs in pairs or in chains. It stains easily with all the aniline dyes and is decolorized by Gram stain. It grows best on media containing blood serum, forming small glistening colonies that pit the surface of the media.

Most observers state that the organisms can be demonstrated easily on slide preparations if the mucopurulent secretion taken on a loop from the canthi is used. My own experience has not been so fortunate in finding these organisms. I find them hard to demonstrate even in typical cases and base the diagnosis on the physical findings and the prompt response to treatment after the employment of zinc salts. In a typical case of this infection we find one or more of the following symptoms: A redness along the margins of the eye lids with perhaps some slight thickening, if the case has lasted a long time. There is a white deposit that collects along the free edge of the lids and is particularly marked at the outer canthus, where a superficial erosion of the skin is common. The inner surface of the lids is inflamed and there is a moderate amount of mucopurulent secretion along the cul de sac and a ball of the same at the inner canthus.

The ocular conjunctiva is not diffusely reddened as in the other types of conjunctivitis, but selected areas show limited redness of the membrane, hence the term angular conjunctivitis. This is apt to be particularly marked when the disease involves the cornea, which it does in a limited number of cases.

The involvement of the cornea takes place usually at the limbus with a number of small superficial ulcers, though occasionally larger areas are involved. The ulcers are relatively

\*Read before the Eye, Ear, Nose and Throat Section, Kentucky State Medical Association, Louisville, 1932.

indolent in character and have not the rapidly advancing destructive tendency of the pneumococcus ulcer. They of course cause considerable pain and should be treated along approved lines.

Besides the objective symptoms in the average case the complaints most often voiced by the patients are that the lids burn and itch. Some complain of the secretion that gets over the pupil; others complain of an inability to do close work in comfort and may be treated for refractive error or muscle trouble, the conjunctival infection entirely overlooked.

For a number of years I have been impressed with the number of cases of this infection I have seen and its prompt response to the applications of drops containing zinc. Some of these cases had been previously treated with the various silver salts without relief.

Just a few practical reflections about the treatment of these cases. While the case as a rule responds readily to zinc therapy, it has a tendency to recur, so that I have found it expedient to require the patients to use the drops for a much longer period than they deem necessary.

Some observers have noted the presence of the diplo bacilli in the nose for long periods so that it may be necessary to treat this to thoroughly eradicate the disease.

Other members of the family may be infected and reinfection may occur from these. It is best to inquire about these conditions and extend the treatment to the extent necessary.

For the erosion at the outer canthus I have found the  $\frac{1}{2}\%$  Sulphate of Zinc ointment applied at bed time, in conjunction with the drops of course, to be most effective. It is not convenient to use the ointment throughout the day as most people complain of the blurring occasioned by the film of oil.

If the cornea is involved, heat, atropin, may be necessary, and a more frequent application of the zinc drops. If the ulcer is large I touch the involved area with Zinc Chloride solution as required. I want also to speak a word in favor of foreign protein injections in cases involving the cornea. The results obtained are little short of amazing in some cases. An eye that has shown little or no tendency to heal will look, twenty-four hours after such an injection, as well on the road to recovery.

The foreign protein that I have found most effective is the intravenous injection of the typhoid vaccine. As this produces a prompt and considerable reaction its effect should be explained to the patient and they should be instructed to get home at once and lie down for the rest of the day.

In conclusion I wish to direct your atten-

tion to the wide spread prevalence of this disease; to the necessity of its recognition; to the prompt response to the proper therapy, and to its tendency to recurrence.

#### DISCUSSION

**William Thornwell Davis**, Washington, D. C.:

I have been very much impressed by the manner in which the subject has been handled by the essayist; he has covered the ground so thoroughly there is not much I can add to it.

One or two points might be accentuated. I am convinced that this is a very prevalent infection and that it is frequently overlooked because, while most of us would readily recognize a typical case of Morax-Axenfeld conjunctivitis, one which has all the objective symptoms, we might easily overlook a more subjective case. I recall one rather typical case which I experienced considerable difficulty in recognizing. In this case the only symptom was the feeling of having a foreign body in the eye; no redness of the lids, no collection of purulent matter at the inner canthus; refraction normal, appearance of the conjunctiva normal. I could see no reason for the foreign body feeling and I did not think of diplo-bacillus conjunctivitis for about a week, during which the trouble persisted in spite of everything I could do. Then I had a culture made which cleared up the diagnosis.

I find that in the treatment of this condition, especially in obstinate cases, zinc fluorescein gives very good results—putting a little of it on the end of a tooth-pick, drawing the lid down and depositing it in the lower conjunctival sac. As soon as it strikes the tears it forms a gelatinous mass in the lower conjunctival sac and remains there for twenty-four hours, during which time the eye is constantly bathed in zinc solution as the zinc fluorescein undergoes solution in the tears. The only objection to its use is that it is apt to cause the patient to weep orange-colored tears.

**H. G. Reynolds**, Paducah: My experience coincides with Dr. Hall's in that I am unable to determine microscopically the diagnosis in so many cases of conjunctivitis. I would like for Dr. Hall in closing, to explain his method of getting the smear from the conjunctiva. I recall reading somewhere that there was some special technique, if followed out correctly, which would determine the infecting organism, with few exceptions.

**Gaylord C. Hall**, (in closing): I wish to thank the gentlemen for their discussion.

The thing that primarily brought this subject to my mind was the fact that I had a number of cases of conjunctivitis which had been treated by the usual methods without results, and the prompt responses of most of these cases to zinc therapy; also an article by Dr. Hansford McKee of Montreal, written ten years ago, prior to which the idea had been prevalent that this was a disease of the country districts, while



the various types of ordinary conjunctivitis were more common in the congested districts of the cities, but I venture to say that in the past seven or eight years I have written more prescriptions for zinc solutions than for the various treatments for ordinary conjunctivitis. I use 1 to 2 grains of sulphate of zinc to the ounce, or 1 grain of zinc chloride to the ounce. To the latter I add one drop of dilute hydrochloric acid; otherwise there is a little white cloud in the zinc chloride solution. The addition of hydrochloric acid makes it perfectly clear.

I would stress the fact that unless the treatment is kept up for a considerable time after all the symptoms disappear, there is a tendency to recurrence.

As to the method of obtaining a smear, I usually take it from the canthi, where the purulent secretion collects, on a sterile loop and smear it on a slide.

#### THE FULL TIME COUNTY HEALTH DEPARTMENT AND ITS RELATION TO THE MEDICAL PROFESSION\*

G. M. WELLS, M. D.

Bowling Green.

In order that we may know the relationship of a full time health department to the medical profession, it is necessary to know what constitutes a full time health department and its duties. First, the personnel of a full time health department includes a physician, who serves as director, one or more nurses, a sanitary inspector, and if funds are available, a clerk which to my way of thinking is very beneficial as she is able to do the same work the director or nurse would have to do and as she is trained in this type of work probably does it more efficiently and more economically. It is necessary for the doctor and nurse in addition to their regular training to have some special training in the administration and application of public health work. The sanitary inspector likewise should have special training in sanitation. County health work is under the supervision of the Bureau of County Health Work of the State Board of Health and the local county board of health. The duties of a local health department can grossly be placed under three heads: Help in the prevention and control of communicable diseases, Promotion of sanitation, and Educational.

In defining problems confronting a County Health Department, the communicable disease problem probably holds first place. The primary functions of a health department, the

primary reasons for its establishment and inclusion in the body politic, was, and is the control of communicable diseases. It is true the scope of health work has widened and rightly so, but this does not alter the fact that communicable disease control is of paramount importance and this problem should be clearly defined. In Kentucky, tuberculosis is a major problem in every county as Kentucky ranks second in number of cases of tuberculosis of all the states. This problem can be brought more clearly to a focus in a number of ways.

Probably the surest way of getting in contact with all cases is the tuberculin testing of all school children; and by following up the positive reactors, a great deal of hitherto unknown tuberculosis can be found. It has been our experience that practically all positive reactors are contact cases. With a large school population, it may be impossible to make this test to all and follow up all cases in one year, but an effort should be made to test and follow up as many cases as possible. This department is at present attempting to discover as many active cases of tuberculosis as possible and hope to be able to test all contacts as some special care with a known infected child now may prevent an active case of tuberculosis later. The cause and prevention of tuberculosis has been known for the last fifty years yet the greatest death of our young people in the prime of life is from this cause. Although this method is more or less familiar with every one concerned in tuberculosis work, it must be remembered that if this problem is to be attacked efficiently it must be clearly focussed, and tuberculosis looms large as a problem in communicable disease control. Typhoid fever, diphtheria and other communicable diseases should be attacked in the same way. The morbidity and mortality rates for several preceding years should be known as well as the location of the cases and the age group affected. It was by surveys and by studies of morbidity and mortality rates that the problem of diphtheria control was accurately defined. As a result of that work, every health officer knows that diphtheria prevention should be directed to the preschool child.

Some communicable diseases are of such a nature that it is extremely difficult to get even an approximate idea of their prevalence. An example of this is the venereal diseases. Although knowledge is not complete, there is sufficient data to justify the statement that there is no other group of diseases so widespread and so devastating in their effects, not only in the present generation but also future generations. In the area of the United States where syphilis has been

\*Read before the Third District Medical Society at Bowling Green.

reported since 1920, there have been 35,000 more cases of syphilis reported than scarlet fever, 79,000 more cases than all forms of tuberculosis, 500,000 or nearly one-third more cases of syphilis as small-pox and five times as much syphilis as typhoid fever. If any physician or health worker says syphilis is not a problem in his county, it is because he has not looked for it. Most illuminative data can be uncovered if every case that is found is followed up by an examination of other members of the family.

What is true of communicable diseases is true of other problems. In child hygiene the health officer should have an accurate knowledge of maternal and infant deaths and the cause thereof. He too should know the cause and number of deaths under five years and by his school inspection, he can know the quantity and quality of defects in school children.

All this knowledge should be at the disposal of the physicians so that they through the co-operation of the health department may be more able to intelligently treat and advise those who may call upon them for medical advice and assistance.

As I am interested in Warren County, I have secured the mortality rates for the last four years and will give a comparison of statistics which will clearly show the need of concentrated health education in this county.

The infant death rate in Bowling Green in 1927 was 52.2 per 1000 babies born as compared to the average of 11 of the largest cities of the state which was 71.8; the state average was 62.3. The infant death rate for 1930 is as follows:

Bowling Green 76.7. The average of the 13 largest cities 71.8 with the state average of 67.2, Bowling Green being 9.5 above the average of the state whereas in 1927 it was 10.1 below the state average.

The mortality rate from tuberculosis and typhoid in Warren County as compared to the state as a whole is as follows: In 1927 Warren County death rate per 100,000 population from tuberculosis was 142.1, that of the state was 108.1. For the year 1930 tuberculosis in Warren County was 160.6, for the state 94.5. In 1927 Warren County death rate per 100,000 population from typhoid was 32.2, the state as a whole 17.4. 1930 typhoid in Warren County was 11.8, state as a whole 15.8. The death rate in Warren County due to preventable diseases in 1927 was 424.6 per 100,000 population, in 1930, 519.6. This was only exceeded by one county in the state, that with a rate of 799.2 per 100,000. Total death rate in Warren County compared to state—Warren County in 1927 10.4, state 10.8; Warren County in 1930 13.9, state 11.3. In

1927, 39 of every 100 deaths were due to preventable diseases. In 1930, 42 of every 100 could have been prevented. Another indication of the sanitary condition of a community regarding its milk supply, water supply, toilet facilities and screening of its homes is determined by the amount of intestinal diseases. We find the number of deaths reported in Warren County in 1927 of diarrheal diseases under two years old was 13; other diarrheal diseases 11, making a total of 24. In 1930, death from diarrheal diseases under two years was 24, and other diarrheal diseases 20, making a total of 44. The population of Warren County in 1927 was 31,000 in 1930, 33,679, showing an increase in population of 8.6% while the death rate for diarrheal diseases reported had made an increase of 83.6%.

You may ask what can be done regarding this increase and what advantage to the medical profession or the people by having a full time health department. This is a day of specialization. I believe all will agree a man of equal intelligence should be and is a better surgeon if he concentrates his mind and efforts on the technique and study of surgical conditions. Same is true with eye, ear, nose and throat and internal medicine. We believe public health work to be no less a specialty than any of these. To my mind there are two reasons a full time health department can be of material help to the medical profession of a community. First, it is the duty of a health department to assist the local physician in determining the source of infection in any communicable disease and controlling the contacts, etc. The doctor has been especially trained to take care of the sick and as a rule he is too busy in that capacity to go into the minute details in many cases of discovering source of infection and contacts of a given case. Second, the laity usually only think of calling their doctor when some member of the family is quite ill, in many cases after much harm has been done which could have been prevented.

The public health worker has more opportunity to meet with the presumably well people. In other words the health worker should be a guide post for the people of a community directing them to their family physician, and to accomplish the health educational work the average practicing physician is not doing.

The greater our experience in public county health work the more we realize the need of an increased educational program. There are many things pertaining to our work of which the laity and physicians are skeptical and in most of these cases we find it due to the lack of properly understanding just what we are attempting to do, and on being given the



proper explanation, reasons and facts justifying the work, whatever it may be, in the majority of instances they give their hearty support. Probably our greatest field for health education is in the school, for rather than being a luxury health education is a necessity and a pre-requisite for good citizenship.

Why public health in the schools, you may ask. Because of its need in the life of a child, because of its place and province as an educational factor, and because of the practical benefits to be received for the physical, mental and cultural welfare of the child. The schools need public health education and public health needs the schools. The public health workers are not trained normally in the teaching processes of the school and the public school teacher does not have a very extensive training in public health. Therefore, it is necessarily some one's particular problem in a community to administer the office of public health and to study the needs of that community. This we believe can best be accomplished by the full time health department. Through patient and persistent effort this movement has gained favor and this work has grown until now 80 counties in the state of Kentucky have full time health departments. For a number of years there was much groping in the darkness through the process of developing this public health program. The administrative forces of our schools have been magnanimous. Superintendents, supervisors, principals and teachers have given their efficient and constructive cooperations until now an efficient public health program is an essential adjunct to every community.

The physician should be given his just deserts of being the world's greatest hero battling as he does against the countless unseen, unknown allies of death which menace him as well as his charges.

The mechanical trades are exacting. Few apprentices began not with a master piece but by sweeping floors and handing the master his tools. Each thing he learns by constant repetition not merely a theory learned or an operation seen once or twice.

Medicine on the other hand is intangible, incomplete. We cannot see the intestine writhe, the mind unhinge and antibodies form as we can a wheel whirl or a lever move up and down, nor can we solder up an aneurism or brush the cob webs of the brain with a whisk broom.

The body cannot be over-hauled like a broken machine. Worn out pieces replaced and bearings tightened here or there. Any physician even the surgeon can but help his patient assist nature, cure or stumble along

as best she may, for this reason I believe the great step in medicine and dentistry is to be the development of preventative methods, teaching the people how to keep well rather than to be cured, and how to keep their teeth rather than having them replaced, and the chief income of the doctors and dentists will come not from curing diseases but from preventing them.

#### ;—MALARIA\*

J. A. COLEMAN, M. D.

Stone.

The object of this paper is to place before you a disease of which in this section, I suppose, there are very few cases seen—Malaria, a disease which I consider next to syphilis, the most difficult as far as diagnosis is concerned although many cases are truly text book cases, but many more are not. This is often due to latency, number of times bitten by different mosquitoes or at different times by the same mosquito, chronic cases, and the personal equation or physical make-up of the different individuals.

The majority of cases are seen in the fall and spring; in the dry season instead of the rainy season; in localities as certain sections of a town; tertian predominant in one section, aestivo autumnal in others, the quarant type never seen by me except in New Orleans.

As we all know the classification of the malaria parasite is as follows: Plasmodium vivax (Tertian) Plasmodium, Malaria, (Quarant) and Plasmodium Falciparum or Aestivo Autumnal all being transmitted only by the female mosquito for as you know the female of the species is more deadly than the male. The winter host is man, as the majority of mosquitoes are killed by the cold weather, although I have seen them survive through out the winter in clothes closets and cracks of wall, unused chimneys, etc. Often people may carry the parasite in their blood for years, the parasites being deep in the bones as the bone marrow and spleen and capillaries of deep muscles. I have found the parasites in the blood of a patient, who having suffered from a fracture of the leg or arm later develop a fever and chills in four to ten days following the break. Often after a maternity case is ready for dismissal, the patient will begin to have chills and fever which must be differentiated from a puerperal sepsis, sapremia, or an old gonorrheal infection which often flares up about the seventh or ninth day.

The symptoms are varied and often unusual as from growing pains to periodic

\*Read before Pike County Medical Society, March 8, 1932

headaches. Of course in the text book cases we have chill, fever followed by profuse sweating. The temperature ranging from normal to 105 degrees. The chills may be one every day or every other day or several in one day, confusing it with pyæmia or some other infection. Of course in a chronic case we get the palpable spleen, not so often seen in early acute cases. Headaches more often than not, pain in arms, legs and back, often nausea and vomiting and pain in epigastrium or lower right quadrant confusing it with appendicitis. I have helped, seen and know of cases operated upon for appendicitis, the cases being solely due to malaria. Other cases may give only a daily headache with no fever nor aching, nor anything else except lassitude or an apathetic condition. Other cases may show no chills but a high fever, a palpable spleen, furred tongue, nausea vomiting petechial spots, headache confusing it with typhoid or Brills disease. I have seen and know of cases treated for typhoid which on examination of the blood were positive for malaria. And I know of cases of early typhoid treated for malaria and I have seen three or four cases of both typhoid and malaria present at the same time. It is my opinion that the malaria was latent but on the development of typhoid the malaria became active.

In malaria the tongue is usually thick furred and the prints of the teeth on tongue edges are so pronounced until the number of teeth might be determined by the pits in the tongue. Do not tell an old country doctor that malaria can't be told by the tongue, for I have seen it demonstrated and the parasites found in the blood smear later.

The pulse is often rapid in proportion to the temperature, nervousness is present but not as marked as in typhoid. Vomiting may or may not be present. If so, it is often hard to control and often hypodermics or morphine are given until enough quinine can be given to control the vomiting or the quinine is given hypodermically until the vomiting ceases. Often cases show no symptoms or signs other than general aching of the bones, possibly due to the swelling of the bone marrow. Blood examination shows a slight increase in leucocytes, anemia of the red cells and a slight increase in the large mono-nuclears, or else no change. The spleen is enlarged in chronic cases from being palpable to extending to and below the iliac crest. Age plays no part as I have treated babies six months old with spleen extending below the iliac crest to patients 85 years old.

As I have previously stated, malaria, in my opinion is often carried in the deep small capillaries for years, or there may be a reinfection or a recurrence.

In mistaken diagnosis for appendicitis examination of the appendix shows some petechi, enlargement, more on the order of a chronic appendix. It is my opinion that the plasmodia cause the erythrocytes to swell blocking the fine capillaries thereby producing an infarction of the blood supply to the appendix.

In a southern state it was estimated that there were about 90,000 cases of malaria unreported. There were about 600 or 700 deaths due to malaria, 1,700 tuberculosis and 57 diphtheria.

In some cases we see a meningitis or rather meningismus, convulsions, coma and death. I know of two cases which died—chills, no fever, coma and death in forty-eight hours. The symptoms are so varied and often so vague until we usually ruled malaria out first in questionable cases.

The prognosis is good providing the patient is not suffering from chronic nephritis or Bright's, as they do not take quinine very well and the kidneys seem irritated and become more involved.

The differential diagnosis, with syphilis, typhoid, pyelitis, meningitis, puerperal sepsis, neuritis, lumbago, migraine and host of others.

I used the standard treatment in the majority of cases, 30 grains daily as long as the symptoms were present, then 20 grains daily for a few days then 15 grains for about a week then 10 grains daily for eight weeks to 100 days. In quinine fast cases, I have resorted to neosalvarsan, cacodylate of soda. I have never used plasmochin as it was new and at the Malaria Congress or meeting in Miami several deaths were reported. It seems that there was a paralysis of respiration, but since they have found out that the dosage was too much it has been reduced and a little quinine added, about two grains to the doses of plasmochin which is about 1-6 grain T. I. D. Of course the treatment is usually preceded by a round of calomel, followed by a saline, antipyretics, aspirin or any coal tar product for headache and fever. Quinine by hypodermics has been used quite a great deal intravenously. A very dangerous procedure unless well diluted and not more than 7½ grains at the time. Fifteen grains have caused death to my personal knowledge. I always gave it subcutaneously diluted in saline. I usually take one 2 c. e. ampule of quinine dihydrochloride 15¼ grains and added sterile saline (N) until neutral to litmus. Then I give according to age and severity, 5 to 15 grains. Usually 1 grain to the c. e. No abscess formation nor reaction has followed this procedure. Usually one to three hypodermics were all that were necessary until



the patient was conscious or could retain the quinine by mouth.

I do not believe so much in the prophylactic treatment except the elimination of the mosquitoes as I know of no medicine which is a specific for malaria and at the same time remains in the circulation for any length of time.

Examination of slides may show every stage of plasmodium in development from the chromatin granule to the merozoites. In malignant malaria of P. F. the rings are most frequently seen and only the ring formation—crescents seldom. When they are seen they are usually near the border of the smear. Of course each of you know the appearance and characteristics of a smear showing the different types of malaria consequently I will not dwell any more on that phase of the subject.

I wish to present some interesting cases that I have seen in consultation or treated.

Case No. 1. Male, age 4. Fever 104, pulse about 150, meningismus, convulsions, coma and blood smear positive for aestivo autumnal. Quinine 5 gr. sub-cutaneously q four hours; was conscious in about 6 hours, fever 100; about three hypodermics given, then 2 gr q 4 hours by mouth until all symptoms had subsided, then 2 grain B I D for 8 weeks. No complications—recovery.

Case No. 2. Child age 1 year. Symptoms of meningitis, high fever, conscious, able to take quinine by mouth, smear negative or questionable. Two gr. quinine q 3 hours, increased to 3 gr every four hours—recovery.

Case No. 3. Child age 7. Aching, fever 107, pulse 140, spleen palpable, a recurrence tongue furred, profuse sweating later, quinine by mouth—standard treatment, recovery.

Case No. 4. Male, age 38. Chronic headache, lassitude, tired all the time, as much so on arising as on going to bed, blood examination positive aestivo autumnal. Standard treatment. Disappearance of all symptoms increase in weight and physical vigor.

Case No. 5. Male, age 50. Nausea vomiting, aching, (headache) chills daily, fever 102 to 105, albuminuria, blood examination positive, 8 days later positive Widal W B C 18,000, dichroic pulse, rose spots, delirium, treated standard, quinine in syrup jellies 5 gr. to oz. also treatment for typhoid, recovery 28th day, 5th week drove a car 300 miles, loss in weight 17 pounds. Diagnosis: Typhoid and Malaria.

Case No. 6. Male, age 48. Chills two to three daily, fever 104, rapid pulse hemorrhages from bowels. Smear positive, four other cases in family, but only this one developed typhoid. Quinine daily 30 to 20 grains for about 8 weeks. Positive Widal, palpable spleen, chills recurred if quinine

left off more than 3 or 4 days, neosalvarsan 6 decigrams every 4 days for 4 doses, carco-dylate soda  $7\frac{1}{2}$  grains twice each week for three weeks—recovery—embolus right leg producing a milk leg.

Case No. 7. Male, age 37. Frequent headaches, tonsils had been removed, teeth pulled, blood examination positive—quine, neosalvarsan 6 gm. weekly for six successive weeks—recovery—recurrence every year for three years to my personal knowledge reinforcement was my opinion.

Case No. 8. Baby 6 months. Convulsion, fever, 105, spleen four fingers below costal margin, blood positive, calomel, oil, aspirin 1 gr., quinine 1 gr., every 2 hours for 4 doses then every 4 hours, standard, recovery.

Case No. 9. Female, age 84. Nausea vomiting, chills, headache, fever 105, unable to retain water, blood positive, quinine 15 gr. subcutaneously B I D for 3 doses then quinine by mouth, recovery.

Case No. 10. Male, age 20. Fever 102, no chills, pain over appendix, rigidity, nausea vomiting, constipation, blood negative. Operation showed appendix almost normal, developed a chill next day with fever 103, blood examined again positive for Tertain. Quinine given and symptoms subsided, recovery.

Case No. 11. Male, age 55. Chills, fever 102, profuse sweating, nephritis, casts of all kinds, blood positive, quinine and treatment for nephritis, malaria cured, nephritis improved.

Case No. 12. Female, age 12. Fever 103, pulse 100, spleen palpable, emaciation, confused with typhoid, blood positive for aestivo autumnal. Patient from a section where many other similar cases had been treated for typhoid, recovery prompt.

Case No. 13. Male, Negro, age 35. Loss of the use of body from about waist down. Diagnosed syphilis when U. S. V. patient, treated for syphilis, no improvement, evidently were crescents as after three of four months, developed chills, fever, blood smear positive for crescents. Standard treatment, symptoms subsided, condition improved.

Case No. 14. Male 21. Fever, pain over appendix, nausea vomiting, no chills, previous diagnosis, appendicitis, blood positive, quinine standard treatment, symptoms subsided, recovery.

Case No. 15. Male, age 82. Chills, fever, blood positive, with every stage of plasmodia seen, quinine and recovery.

Case No. 16. Female, age 18. Seven months pregnancy with pyelitis with malaria, smear positive, fever 105, chills two to three daily, quinine, iodine, antipyretics calomel, followed by saline, bromides. Pyelitis treated and complete recovery and pregnancy went to term.

Case No. 17. Male, age 20. Typical malaria, chills, fever, sweating, nausea, vomiting, headache, 15 gr. quinine intravenously death in 15 minutes. Patient cyanotic.

Case No. 18. Male, age 26. Ice truck driver. Sprained ankle, Gibney splint applied, following hot packs, six days later, chills, fever, typical malaria, smear positive, cleared up on quinine treatments.

Case No. 19. Female, age 20. Primipara, normal delivery, chills, fever 105.5, syncope 7th day, blood smear positive quinine standard, recovery.

I regret that I have taken up so much time but I wanted to give you some examples of the most outstanding cases and how these may be confused with other diseases except for the blood smears, again it is my contention that next to syphilis, I find that malaria is the most confusing of any other disease.

I must admit that I have made many hurried diagnosis, wrong diagnosis, but in the majority of instances the treatment of malaria cleared up most of the cases that were doubtful when tentatively diagnosed as malaria.

#### THE IMPORTANCE OF THE RECOGNITION OF EARLY CERVICAL CARCINOMA WITH SOME REMARKS ON TREATMENT\*

QUITMAN U. NEWELL, M. D., F. A. C. S.

St. Louis.

The importance of the recognition of early cervical carcinoma is of vital interest to every practitioner of medicine today. All Gynecologists are agreed that the treatment for cervical carcinoma is either operative, radium or x-ray therapy, and that the greatest per cent of cures is seen in those cases which apply for treatment when the disease is in the early stage.

There are some investigators who believe in radiation for all stages of the disease and others who believe that radical hysterectomy is the treatment of choice in the early stage and radiation only in those cases which have become inoperable. The statistics now available dealing with the use of radium and x-ray in the treatment of cervical carcinoma for the past fifteen years have not convinced us that this form of treatment is superior to radical hysterectomy. Available statistics dealing with both forms of treatment show a similar per cent of cures, namely 20 to 25

per cent. This is due in a large part, to the fact, that 90 per cent of cancers are not seen until they have reached an advanced stage, and if we are going to raise our percentage of cures to the much heralded 50 per cent or more, we must see the cases while in the early stage of the disease. Also, in dealing with radiation treatment we must consider that cancer cells are radio resistant and radio sensitive and at this time we have no absolute information that will determine which type of cancer cell is resistant or sensitive to radiation. Some investigators, Martzloff, Broeders and others, have suggested cell grouping as a method of determining the malignancy of the cells; while Healy and others have suggested giving a small dose of x-ray as a therapeutic test to try out the action on the cancer cells before instituting radical treatment. Probably 20 per cent of cervical cancers are radio resistant and until we know more about this condition I feel it is best to remove the cancer by complete hysterectomy, if seen in the early stage, and use radium and x-ray therapy in those cases that have advanced beyond operation,—successful therapy depending on recognizing the disease in its early stage. Therefore, it is our duty to lay safe and sane plans for educating both the lay public and the medical profession, in order that there shall be strict co-operation between the patient and physician. The patient must be educated to see her physician regularly and the physician must be well versed in the fundamentals of cancer in order that he may make an accurate diagnosis at the time of the examination.

It is strange that a disease which was well known to the ancients and feared at all times should be so disastrous to the human race at the present time and that we still are absolutely ignorant as to its exact cause. It is a matter of fact that cancer occurs more frequently now and is definitely on the increase.

In the past fifteen years the American Society for the Control of Cancer, the American College of Surgeons and the American Medical Association have attempted extensive education for the lay public in the fundamentals of cancer. The work has been extensive and far reaching, and undoubtedly much good has been accomplished. After the public has absorbed much of the information and has become "cancer-minded," will the medical profession, generally speaking, be equally prepared to render efficient service to those who apply for it? In other words, the medical profession as a whole is not yet prepared accurately to diagnose the disease which it is called on to treat, at a stage which permits of effective treatment, nor are all gynecologists or radiologists prepared to offer the proper therapy. It is not my intention to

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\*Read before the Jefferson County Medical Society, Louisville, March 21st, 1932.



criticize the practitioner in the rural districts, for he is no more incapable of making his diagnosis than his fellowman in the city. The diagnosis of cervical cancer is not made by many practitioners because they allow themselves to become too busy in their general practice to make a careful pelvic examination of every woman who consults them. Every woman, regardless of her age, should have a very careful pelvic examination twice each year and if there is anything found that is beyond the normal scope, she should be referred to some competent gynecologist for classification and treatment if it is deemed necessary.

Let us ask ourselves: can we make a diagnosis of early cervical carcinoma? The answer is: there are no clinical symptoms suggesting early cancer, so we therefore must resort to microscopical report.

Carcinoma of the cervix cannot be expected to give early symptoms: there is no function to be interfered with, a watery discharge is not typical, and when bleeding occurs the condition is far advanced and the tissues are breaking down. The gross appearance of early carcinoma of the cervix is in no sense typical. In fact, it is exceedingly difficult to distinguish chronic cervicitis with erosion, tuberculosis of the cervix and gumma of the cervix from an early infiltrating carcinoma with ulceration. Erosions as a result of irritating discharges, follow the termination of pregnancy and are seen in young women. Since these causative factors of erosion are less common in women over forty years of age; likewise erosions are infrequent, and when found at this time of life, they should be regarded with grave suspicion, for many of them are actually instances of early cancer. The common gross anatomic lesions seen in early cervical cancer are: an enlarged cervix, somewhat nodular and irregular, and an irregular external os which bleeds on the slightest manipulation. These early changes in the cervix are probably due to the invasion of the normal structures of the cervix by the growth and to increased tissue production and disturbance of the lymphatics.

The early lesion of cervical carcinoma in my experience has not been one of ulceration, but rather one of a small nodule which very readily ulcerates later and the lesion is usually in this stage when recognized and that causes us to believe it the early lesion. Therefore, the early recognition clinically is purely speculative. However, we do know cancer of the cervix is preceded always by a chronic cervicitis or lacerations of the cervix with ectropion and these lesions must be cured as quickly as recognized and in this way prevent cancer.

An unusual lesion about the cervix should be very carefully investigated. A biopsy is always to be considered, and in performing a biopsy, always be sure sufficient material is removed and that it is obtained from the most involved area. Obtaining a biopsy is a very important step in diagnosing cancer and many cases are erroneously diagnosed because the material removed was insufficient and was not obtained from the most involved portion of the cervix. I think it is a good policy when obtaining a biopsy of a suspicious cancer cervix, to remove the cervix by a conical excision operation, the same as you would perform for a cure for chronic cervicitis. More often, perhaps, it means the diagnostic elimination of cancer, with ensuing peace of mind for the patient and with the consciousness on the gynecologist part, of a diagnostic problem properly handled.

There has been much discussion as to the possible dangers of biopsy—whether or not it may permit of metastasis of cancer cells. There has been no convincing evidence to substantiate this statement. Furthermore, even if there were some risk, biopsy is so essential for an accurate diagnosis of cancer, it should be performed before exposing the patient to a major operation. The seriousness of a biopsy causing metastasis of the cancer cells is so slight as compared to the dangers of a radical hysterectomy performed for a non-malignant cervix that one should dismiss the thought entirely.

It is on the hospital pathologist that the burden of making the diagnosis finally rests. Mistakes in the diagnosis between non-malignant and malignant diseases are more readily made here than in almost any other tissue because of the frequency of inflammatory lesions which resemble malignancy in many ways. This is in part because of the invasion of the deeper tissues by the squamous epithelium. E. Novak, October, 1929, American Journal of Obstetrics and Gynecology, has described this condition in detail.

Good pathologists are becoming scarce, due to the fact they have received very little encouragement in the past. Their pay has been insufficient and with very little to look forward to in the future their training has been sadly neglected. The opportunities for training pathologists are not particularly "rosy" at present and the profession is suffering from the fact that there is no financial or clinical future for a hospital pathologist. Many of our medical schools are trying to meet this grave situation and before a young man can be pronounced a specialist in any particular branch of medicine he must serve one to three years in pathology pertaining to the branch of medicine he is specializing in. In this way, it is hoped that each de-

partment of medicine will soon build up its own organization and have a perfectly functioning laboratory where careful diagnoses can be made. Such a laboratory forms an integral part of the obstetrical and gynecological service of our school and renders invaluable aid in arriving at cancer diagnoses. The gynecologist pathologist has a decided advantage over the general pathologist who is so commonly called on to make a diagnosis. A knowledge of the special histology of the uterus and a familiarity with the pathologic pictures peculiar to the reproductive tract give a decided advantage to the pathologist who has the opportunity of studying these problems daily.

The facts are at present that only about 10 per cent of cervical cancers, even in the large cities, are susceptible of operative treatment with probability of cure. A small per cent of the advanced cases are available for curative radiation therapy. However, as already said, the educational campaign has been extremely effective in arousing the public, especially in the larger cities, to see their physician from time to time and as a result, gynecologists and radiologists are now asked to diagnose and to treat cancers in a stage much earlier than they were seen a few years past.

At Barnes Hospital from July 1st, 1921 to April 1st, 1926, Dr. H. S. Crossen, and the author, treated 121 cases of uterine cervical carcinomas with a five year cure of 22.3 per cent. The cases were grouped clinically before treatment was given as follows:

Class 1. Cases in which only the cervix was involved and the treatment was radical hysterectomy.

Class 2. Cases in which the cervix was involved and there was slight involvement of the parametrium and the treatment was radium followed by radical hysterectomy.

Class 3. Cases in which the cervix was involved and there was parametrial involvement to the pelvic wall and the treatment was radium and x-ray therapy.

Class 4. Cases in which there was extensive involvement of the upper vaginal vault including the bladder and rectum and the treatment was deep x-ray therapy.

In class 1, there were 2 cases. In class 2, there was only 1 case. In class 3, there were 108 cases and in class 4, there were 10 cases. From a careful study of the above figures one can readily see that most of the cases (118) reporting for treatment were far advanced and had symptoms of cancer for more than six months. These figures compare favorably with those of other gynecologists. The three cases in class 1 and 2, were seen early

and operated upon and are living and well after five years. All of them received deep x-ray therapy with a 200,000 volt machine, following radical hysterectomy, before they were discharged from the hospital. The 10 cases in class 4, received only deep x-ray therapy because they were too far advanced for radium treatment and none survived beyond three years. Of the 108 cases that received radium and x-ray therapy, 24 are living and well after five years.

Our technic for applying radium is as follows: The radium bromide salt is used. It is sealed in a glass capsule, this capsule is then placed in a silver capsule 1 mm. thick: the silver capsule is then placed in a brass capsule 1 mm. thick which is then placed in rubber tubing. In this form it is inserted into the uterine and cervical canals. If there is any chance of the radium getting out of position after its application, it is well to suture the cervix to hold it firmly in place. The dosage of 100 mg. is used (25mg. in uterine cavity—75 mg. in cervical canal) for 20 to 50 hours depending upon the amount of involvement of the cancer and the amount of tissue present for screening. Gauze is used to pack the bladder and rectum well away from the radium. In many cases a small rubber tube drain is inserted into the uterine cavity along side the radium to take care of any pyometra that may be present. A retention catheter is placed in the bladder at all times. We have had very few bladder and rectal fistulae.

Most of the radium cases received a series of deep x-ray therapy before leaving the hospital and thereafter every six weeks as the condition of the cancer warranted.

We have found that the fact that the patient realizes she will be seen and examined by the person who operated upon her and who therefore, from her viewpoint, has a personal interest in her case will insure a high percentage of returns. In order to get the best co-operation of the patient, in most instances the patient is told she has cancer and the seriousness of the malady is explained to her. Of course, there are a few patients whose mental state is such that it is best not to tell them, but rather to explain her condition to some of her kin so they will see that she returns at the appointed time. We have realized for sometime, that the greatest success is achieved by absolute co-operation from the patient. If they know they have cancer, regardless of the fact that they have no suspicious symptoms after they have received treatment, they will return regularly for pelvic examination.

In our gynecological clinic it is interesting to note the number of early cancers of the uterus being discovered in the past few years.



All of the men working in the clinic are "cancer-minded" and I am sure our next five years report will show more gratifying results than the present one.

#### DISCUSSION

**Edward Speidel:** Ladies and Gentlemen: This has been an eloquent presentation made by our distinguished guest. It should interest all of you, however, to know that he is one of a group of splendid cooperating Obstetricians and Gynecologists associated with the Barnes Hospital of St. Louis. Dr. Crossen, with whom Dr. Newell is associated, Dr. Otto Swartz and Dr. Dorsett, (both of whom have been guests of the Society) and Dr. Royston, have their own Pathology Laboratory with Dr. Diekman, one of the most distinguished Pathologists of this country, in charge. This explains the splendid presentation that has been made before us this evening.

Dr. Newell's idea of having every woman appear before her physician twice a year for examination, of course, is ideal; but it will probably be many years before this can be accomplished. The better class of people may make such a visit just as they go to the dentist; but the poorer class of people can hardly be expected to make use of such attentions. Fortunately, the Obstetricians can take an important part in the early diagnoses of these conditions, if the patients come to them early in pregnancy. If routine inspection and repair of these cervixes is done after birth of child, a great deal of cancer may be prevented. Also, if patients will return at intervals of two, four and six months after birth of child, for final inspection of cervix.

I am rather interested in the biopsy method, that of coning out the cervix as the first step of the operation. I would like to ask Dr. Newell what the next procedure is. Is the diagnosis made, and if it is cancer, is radium applied, or is the operation completed in the ordinary manner?

**Harry A. Davidson:** I would like to ask Dr. Newell two questions: In the first place, what does he think of Leukoplakia as a cause of cancer? In the second place, what does he think of the Colposcope, an instrument devised by Hinselmann of Hamburg, to magnify the cervix ten to forty times, as to its influence upon the discovery of early cancer?

**A. J. Miller:** I am very much delighted indeed to see this method of obtaining biopsy tissue stressed. It is one of the problems of the pathologist to get a sufficient amount of tissue properly excised from the proper place.

In regard to the dangers resulting from biopsies on tumors, it seems that they are less, or possibly of slightly different nature, than is commonly believed. It has been pointed out experimentally that mechanical manipulation of any kind does not enhance the growth of neoplastic tissue, nor of normal tissues *in vitro*. It is not possible to definitely demonstrate an en-

hancement of the growth of neoplasms *in situ*, as the result of mechanical manipulation. This was pointed out a few years ago by Woglom.

The danger which does exist, however, is that of producing metastasis by the mechanical manipulation. What apparently happens is this: That during the excision of tumor tissue or during the manipulation of the examination, emboli are discharged either into the blood or lymph vessels and these emboli result in metastasis. This process was also demonstrated experimentally by handling the neoplasms of rats. The tumors used were the laboratory strains of carcinoma and sarcoma, which were inoculated beneath the skin. After a period of growth the tumors of these animals were massaged and the animals autopsied at varying intervals after this manipulation. Lungs were sectioned serially so as to find the tumor metastasis that had occurred as a result of the manipulation. The emboli were very numerous. However, in the case of this particular tumor only a few of them grew, but the work had demonstrated that the possibilities of metastasis were very markedly increased as the result of mechanical manipulation of neoplasms. Certainly this fact should be borne in mind during operative procedures or during physical examinations of the patients with neoplastic diseases.

It is discouraging to hear pointed out the fact that so little can be learned from detailed morphological study of neoplasms, but it serves to remind us that the cancer problem is a biological one. The biological activity of a tumor as related to its morphology has been learned chiefly by experience and observation, rather than by inductive study. However, the relation of morphology to the biological activities in the case of brain tumors has been very well demonstrated by Bailey and Cushing and others. Greenough and others have also pointed out a good relationship in the case of carcinomas of the lip. These two things should be encouraging and certainly warrant the expenditure of further effort to determine some relationship between morphology and the biological characteristics of neoplastic tissue.

**D. Y. Keith:** All of us have been benefited by Dr. Newell's presentation. Most of us will agree with practically all he has said.

I would like to make a few inquiries as to his grouping and if he has changed his dosage in the past five years. All of us who treat carcinoma of the cervix try to group the cases, using the same system that he has referred to. The difference is that what one physician would class as group I another man would probably class as group II. This makes it very difficult in comparing statistics and also makes a difference in mortality of operators who are equally efficient.

It is quite well known to all that roentgenologists, gynecologists and surgeons prefer opera-

tion in group I which is usually not more than five or six per cent of the total cases seen. Patients above forty years of age we would prefer giving 3000 or 4000 milligrams of radium twenty to thirty days prior to operation. All the other groups are radium cases.

At present very few people who treat a large number of carcinomas of the cervix use less than five or six thousand milligram hours or even more. The technique Dr. Newell has referred to using 3000 to 3600 mg. hours has not been used by us for eight or ten years. We use larger doses and higher filtration.

In groups III and IV we are quite sure they will go longer without a recurrence with an occasional permanent arrest of the malignancy where both radium and x-ray has been used. We are quite sure x-ray is of definite benefit in cases of this group.

Patients returning four years after radiation with recurrence will quite frequently derive great benefit from x-ray alone and be carried for another period of months or years before the final fatal recurrence occurs.

I think it was wise to say something of the technical side of radiation. You state the number of milligram hours which helps very little as to dosage. Location and filtration are also essential. At present the trend of gynecologists and radiologists is to use platinum filtration which is of much higher filtration than silver which was referred to by the essayist. When platinum or other filtration equal to one or two millimeters of lead is used, a much longer time is given, preferably with several points of intensity. In this way the lateral margins of the pelvis receive a more effective radiation and between several points of intensity less local necrosis is present. We are quite sure it is an advantage to use higher filtration. In our present technique we use from four to six points for application and we frequently use 6000 to 8000 milligram hours.

Dr. Newell's statistics compare with most of the statistics and I see nothing in them that is misleading, as is so frequently done when statistics are presented.

**Mischa Casper:** What has become of the Percy Cautery treatment, or diathermy, to be used in Clinics?

**Q. U. Newell,** (in closing): Thanks to you gentlemen very much. I was very much interested in your discussions.

It is really a terrible thing that everybody jumps on the poor old pathologist. Ordinarily, a pathologist is given an insufficient piece of tissue and told to look at it and tell what it is. This is not right; one should indicate the structure from which it is taken. We should all cooperate with the pathologist. And we ourselves, should familiarize ourselves with slides.

Leucoplakia invariably precedes carcinoma. Very few of us, however, have ever seen a leucoplakia of the cervix. I have seen one or

two cases.

As to the value of the colposcope in discovering early cancer: It probably has its merit but the instrument is rather expensive at this time and is not often used.

Now, regarding hysterectomy following radium. I have tried it in all stages and am about convinced that four to six weeks after radiation is the best time to operate. The patients at this time get along very well; hyperemia and unusual vascularity in the pelvis is not common after so long a period.

We do not ordinarily get glandular involvement early, although we expect an extension of cancer. We know that cancer goes out into the lymph nodes—yet I have seen autopsies on several cases of these carcinomas and was surprised that some of them did not show metastasis higher up in the pelvic structures. One would think that all the lymph glands supplying the pelvic organs would be involved. We do not know why in some, this metastasis is rapid, in others very slow, and in others it is not seen at all. It was asked if we looked for glands when doing hysterectomies. No, we do not, as we only do hysterectomy on the very early case and the glands have not become involved.

As to radical operation in these cases: Several years ago we did what we called radical work. It took about 2½ hours to do an operation of this kind. We went in and isolated the ureters all the way to the pelvis before doing the hysterectomy and at the completion of the operation the patient was invariably in shock. Now, under spinal anesthesia, ureteral catheters are slipped in the ureters up to the kidneys and with an improved technic a radical hysterectomy is performed within 1-1½ hours.

We have secured better results by implanting radium seeds in case of recurrent carcinoma—better than x-ray therapy. About placing radium in the parametrium: I do not approve of it. I think it dangerous. However, they are doing this in some clinics.

As to diathermy: I should think diathermy would be alright if one does not have anything else but it cannot be as efficient as radium.

As to who should apply radium, the radiologist, the gynecologist or the pathologist: there is a great deal of disagreement about this. We however, in our work use the radium ourselves. I believe that only the gynecologist or the radiologist should use it.

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**Action of Specific Enzyme on Dermal Infection with Type II Pneumococcus**—The action of the enzyme which specifically decomposes the capsular polysaccharide of type III pneumococcus was tested by Goodner and his associates in type III pneumococcus dermal infections in rabbits. When injected in sufficient amounts, this enzyme is capable of bringing about a favorable and early termination of the experimental disease.



WHAT THE GENERAL PRACTITIONER  
SHOULD KNOW ABOUT GOITER\*

JOHN R. WATHEN, M. D.

Louisville.

Since I first began the surgical treatment of Goiter a good many years ago, there have been so many methods for diagnosis developed that the entire subject has been rewritten.

With the introduction of the Basal-Metabolism test, the use of the Electro-cardiograph and the general adoption of the use of Lugols' Solution of Iodine, many of the methods formerly used have been discontinued. Likewise the use of local anesthesia with novocain by the nerve blocking method instead of general anesthesia of the old infiltration methods as used by Kocher in former years, and many changes have been made in operative technique.

Based on my own experience, covering a long series of cases, I feel that what is most needed is a better diagnosis as to the exact type of Goiter we have as the treatment will depend upon this more than anything else, and yet the large number of cases seen have been given the same remedies, when we have an entirely different pathology to deal with.

Enlargements of the thyroid gland in young adolescents, especially girls about puberty should not be classed as Goiters, but are physiological enlargements due to development and lack of Iodine. Small doses of Lugols' Solution of Iodine over a short period of time will effect a cure in the great majority of these cases, and they rarely or never should be operated upon. Large cystic or colloid Goiters, with a normal or nearly normal pulse and not toxic should be operated upon and not treated with Iodine because of their possibility of becoming toxic or malignant later. Also they should be removed for cosmetic effect and because of the mechanical discomfort they cause. Occasionally nodular adenomas of small size in patients of about 25 years should be operated upon and not given Iodine for any time, as Kocher has proven that it only tends to make a quiescent Goiter take on toxic symptoms.

The most common types of Goiter we usually encounter are the two types of toxic thyroids, namely the Exophthalmic and the Toxic Adenomas. These types are very different in pathology, symptoms and treatment, both medical and surgical. The toxic secretions are entirely different.

The exophthalmic toxine spends its energy on the central nervous system, and for that reason the nervous system was formerly accused of the cause of the goiter. Iodine is especially valuable in the treatment of this type, the rapid heart is reduced better by

Lugols' Solution of Iodine than by rest in bed, Digitalis and other drugs. Tr. of Strophanthus which was formerly used with much success with the Exophthalmic Goiter was later found to act on the central nervous system and obtain its results, rather than its action on the heart. This type of goiter the exophthalmic, has the highest metabolic rate, is usually of short and rapid duration, beginning about 26 or 28 years of age and reaching its climax at about 32 years, when they come for operation. About ten days treatment with 15 drops of Lugols' solution of Iodine one hour after meals in cold water will usually reduce the metabolic rate and place them in fine condition for operation. If the patient is very nervous, vomiting and dehydrated as they often come to our hospital, Iodine and also Elixir of Veronal given by proctoclysis in the rectum will give results as no other method; for Veronal is the only known drug acting on the vomiting centers of the brain, and the rectum tolerates Iodine well and will take large doses. The metabolic rate is the only test when these cases are ready for operation.

The toxic adenoma cases are a different pathology and require a different preparatory treatment. They are usually of smaller size, are most often bilateral and their toxine spends its energy upon the cardio-renal system rather than the central nervous system. They occur mostly in women about the menopause and are often associated with serious heart lesions, such as auricular-fibrillation and should be studied with the electro-cardiograph. These are the type where a general anesthesia should never be used as local anesthesia with novocain by the nerve blocking methods will suffice. Toxic Adenoma Goiters give a history of long standing from 15 to 25 years and usually have a much lower metabolic rate than the Exophthalmic type.

The Exophthalmic type when operated upon usually, if they die so do in a crisis in the first 36 hours with a high temperature, often above 107 F. while the toxic adenoma cases die due to the heart as myocarditis, etc.

Iodine in the majority of these cases is of little benefit and some eminent authorities as Plummer of the Mayo Clinic say its use is often contraindicated, yet equally good men dispute this idea. He also does not recommend the use of Digitalis in the auricular-fibrillation cases.

In conclusion let me state that upon the proper diagnosis depends the proper treatment as there is a great difference between the various types of Goiter. The proper clinical observation and study of the case with the estimation of the basal metabolism rate and the examination of the heart in some cases with the electro-cardiograph, are essential to proper treatment.

\*Read before the Fifth District Medical Society, Carrollton.

# Kentucky Medical Journal

Published Monthly By

THE KENTUCKY MEDICAL ASSOCIATION  
Incorporated

Entered as second class matter October 22, 1906, at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price .....\$5.00  
Edited Under Supervision of the Council

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NEXT MEETING LOUISVILLE

OCTOBER 3, 4, 5, 6, 1932

## COUNTY SOCIETY REPORTS

**Third District:** The Third District Medical Society met at the Helm Hotel in Bowling Green on April 20th with Dr. S. S. McReynolds in the chair.

Officers elected for the ensuing year: President, Dr. T. H. Turner; Vice-President, Dr. J. W. Grubbs; Secretary, Dr. J. H. Blackburn.

### Report of Cases

Dr. John H. Blackburn, Bowling Green reported a case of postoperative anuria, which was discussed by Dr. J. G. Gaither.

Dr. J. L. Jones, Louisville, reported a case of agranulocytosis.

Dr. G. Y. Graves, Bowling Green, reported a case of cholecystectomy and pyloroplasty.

### Program

Caesarean Section, Evaluation, Dr. J. G. Gaither, Hopkinsville, analyzed a series of 38 Caesarean Section, discussing the diagnosis or indication for the Section, the maternal and fetal mortality and the cause of death in the four maternal deaths. This paper was discussed by Drs. J. L. Jones, G. Y. Graves and John H. Blackburn.

After the luncheon Dr. Orville Miller, Louisville, presented an instructive and helpful paper on "Fractures In and Near the Ankle Joint," illustrating the paper with numerous lantern slides. This paper was discussed by Drs. Lattie Graves and S. S. McReynolds.

Dr. J. L. Jones, State Epidemiologist, Louisville, presented a paper on the "Control of Communicable Diseases" suggesting the methods advised by the State Board of Health for the recognition and prevention of the ordinary communicable diseases.

Dr. G. M. Wells, Director of the Warren County Full-Time Health Unit, read a paper on "The Full-Time Health Department and Its Relation to the Medical Profession," considering particularly the work of the local Health Unit. These two papers were discussed by Drs. Holland, T. H. Turner and S. S. McReynolds.

The meeting adjourned to meet again on June 15th in Bowling Green.

JNO. H. BLACKBURN, Secretary.

**Bourbon:** The Bourbon County Medical Society met on Thursday evening, May 29, 1932 at 8:30 at the Court House in Paris.

The following members were present: Drs. C. G. Daugherty, J. A. Orr, W. M. Hopkins, G. C. Rankin, B. N. Pittinger, R. M. Blemker and M. J. Stern.

Visitors: Drs. Chas. Kavanaugh, John Harvey and Dan Harding, Lexington; Drs. Russell Henry, O. P. Clark and Garland Clark of Winchester; Blanton Collier and Geo. D. Swearingen of Paris.

In the absence of the president Dr. Orr, past president, presided.



Dr. Chas. Kavanaugh, Lexington, read a paper on "Clinical Considerations of Secondary Anemia," illustrated with charts and lantern slides.

The discussion was opened by Dr. John Harvey followed by Drs. Garland Clark, Russell Henry, B. N. Pittinger, C. G. Daugherty, M. J. Stern and J. A. Orr. Discussion closed by Dr. Kavanaugh.

MILTON J. STERN, M. D.

**Franklin:** The regular monthly meeting of the Franklin County Medical Society was held at the Capital Hotel, Thursday, May 5th.

The meeting was called to order by the Vice-President, Dr. M. C. Darnell. The minutes of the last meeting were read and approved. Members present: Drs. Ginn, Martin, Lyon, Jackson, Patterson, Snyder, Stewart, Minish, Darnell, Coleman and Youmans.

Several unusual and interesting clinical cases were reported by Drs. Snyder, Minish, Patterson and Martin, followed by a general discussion.

On motion of Dr. John P. Stewart, seconded by Dr. L. T. Minish, the following Resolution was unanimously voted and adopted by the Society and signed by Dr. Darnell:

RESOLVED: "That the Franklin County Medical Society go on record as unanimously endorsing and commending the services of Dr. A. M. Lyon, superintendent and Dr. C. E. Youmans, assistant superintendent, in their tender care of the unfortunate inmates of The State Institution for the Feeble-Minded and the excellent management and condition of said institution."—M. C. Darnell.

The Society adjourned to the Hotel Dining Room for lunch.

C. E. YOUNMANS, Secretary.

**Grant:** Grant County Medical Society met at the office of the Health Department, May 25, 1932, one week later than the regular time, having postponed the meeting to allow the doctors to attend the Commencements in different parts of the County. The following members were present: J. W. Abernathy, N. H. Ellis, C. M. Eckler, A. D. Blaine, J. L. Price, J. D. George, C. D. O'Hara, W. J. Zinn and C. A. Eckler.

The minutes of last meeting were read and approved and immediately the business of the meeting was entered into.

The first was a resolution sent in by Dr. Mann, who was unable to attend by being detained on a case he could not leave. This was a resolution and a motion that this society endorse the appointment and urge it to be made of Mary Franklin O'Hara for Health Nurse for Grant County, said appointment to be made in June. This resolution and motion was seconded by Dr. A. D. Blaine and unanimously carried by the Society, and a notice of this action was to be sent by the Secretary to the Secretary of the

State Board of Health at Louisville, Ky. At this time Dr. Ellis explained that it was the U. S. Government at Washington that paid the Health Officer and that the State Department paid the Health Nurse. The county having nothing to do with their salaries. Merely paying expenses of offices and laboratories, etc.

Dr. C. M. Eckler reported at this time the serious illness with which Dr. R. E. Limerick has been suffering. The Society was much concerned in this report and instructed the Secretary to write Dr. Limerick a letter of encouragement in his depressed condition. We now entered into the case reports and our worthy Health Officer, Dr. Ellis, made a most excellent talk on the subject of Mad Dogs or Hydrophobia, he says treatment may be started seven days after being bitten, as it takes from fifteen days to three months for the disease to develop in the system. He advises keeping the dog under observation for several days instead of killing it. If the dog is to be killed, do not shoot it in the head or otherwise destroy the head as that will destroy the Negri bodies, hence it can not be told that the dog has Hydrophobia. He recommended a fourteen dose treatment for a patient that is bitten. These fourteen doses cost twelve dollars. The dog's head must be carefully packed in ice, sealed up and sent to the State Board of Health Department for examination.

Dr. Abernathy reported a case of Placenta-Praevia, very interesting saved both mother and baby, which is very commendable.

Dr. O'Hara reported a case of Resuscitation in a New-born Babe, which was thirty-seven minutes before noticeable breathing occurred. He stressed the point that we do not work long enough to resuscitate a new-born babe.

Dr. Price reported a case of Leukaemia with Hemorrhages from the nose and stomach.

Dr. Blaine reported a case of Obstructed Bowels. Patient died, not relieved. He also reported a case of Jaundice in a man seventy years of age, operated and improving. Numerous other cases were reported and discussed, very interesting indeed, and at ten-thirty o'clock, we entered into the discussion of the evening, "Cancer as it relates to the General Practitioner." Dr. Blaine opened the discussion and cites numerous varieties of this dreaded disease in his many years of practice. He reported numerous cases of Cancer of the Aesophegus, cancers of the breast.

Dr. Price was next and states that nobody knows a great deal about Cancer. He stresses early operation, his cases were cancer of the breast in excess.

Dr. C. D. O'Hara states that it is difficult to get people to believe what you tell them in regard to cancer. He cites three cases of cancer of the breast in unmarried girls, ages 16, 19, 22 years. Breast removed by operation. Any

small lump in the breast, he states, should cause removal of the breast and Axillary glands as well. He would use knife first then radium. Believes strongly in hereditary.

Dr. C. M. Eckler says it is up to the practitioner to make an early diagnosis. He divides cancer as to tissue and tells how internal cancer can fool us. Cancers of the breast are kept secret in the majority of cases by patients themselves. One woman, he reported kept a cancer unknown to the family for eleven years. He reported some interesting Sarcomas.

J. D. George reported on internal cancer of the bowel, operated six to eight inches of the bowel removed, uneventful recovery. He had a bad case of cancer of the face, that got infested with maggots. He used chloroform to get the maggots removed.

Dr. Abernathy cautions us about early diagnosis and use preventative treatment at once and early. Brought out the point cancers are not contracted by one to another. He reported a case in a boy nine years old, with an Epithelioma of the eyelid. Had it removed from the eyelid. Finally had the eyelid removed, then went to the brain, formed there and killed him.

It was now growing late, growing close to the midnight hour, and after selecting the subject, "Tuberculosis," for the next meeting, we wended our way homeward, to meet the third Wednesday in June.

C. A. ECKLER, Secretary.

**Franklin:** The Franklin County Medical Society met in regular session at 12 o'clock noon, Thursday, June 2nd, at the Capital Hotel.

Members present: Drs. Coleman, Darnell, Snyder, Minish, Ginn, Travis, Patterson, Heilman, Hollie, Stewart, Martin, and Youmans. Dr. Heilman the president, called the meeting to order. The minutes of the last meeting were read and adopted.

Dr. E. K. Martin, who had charge of the program read a very interesting paper on "Delayed or Postpartum Hemorrhage." This paper was discussed by Drs. Minish and Coleman who related their experience and treatment of such cases.

The Society voted to postpone the regular monthly meetings until September. No other business, the Society adjourned to the Hotel Dining Room for lunch.

C. E. YOUMANS, Secretary.

**Fifth District:** At a meeting of the Fifth District Medical Society, held at Carrollton, May 12., 1932, the following physicians were in attendance: J. T. Walsh, LaGrange; E. N. Northcutt, Covington; C. E. Smith, Covington; S. J. Smock, LaGrange; W. R. Minor, Covington; J. D. Northcutt, Covington; K. S. McBee, Owenton; Richard Cropper, Owenton, A. G. Elliston, New Castle; W. E. Gardner, Louisville; J. Duffy Hancock, Louisville; B. K. Menefee, Covington; W.

S. Snyder, Frankfort; R. B. Guin, Frankfort; J. M. Ryan, Carrollton; B. L. Holmes, Carrollton; Allen Donaldson, Carrollton; E. B. Driskell, Worthville; Owsley Grant, Louisville; A. David Wilmouth, Louisville; W. B. Troutman, Louisville; Walter Hume, Louisville; Ira N. Kerns, Louisville; C. E. Youmans, Frankfort; J. A. O. Bremar, Frankfort; L. Lyne Smith, Louisville; Luther F. Butem, Bedford; J. W. McMahan, Bedford; A. M. Lyon, Frankfort; Jno. A. Wathen, Louisville; Wm. Edgar Fallis, Louisville; R. O. Joplin, Louisville; E. S. Allen, Louisville; Maurice Bell, Eminence; J. C. Hartman, Campbellsburg; L. T. Minish, Frankfort; O. B. Demaree, Frankfort; D. Y. Keith, Louisville; G. C. Hall Louisville; A. E. Threlkeld, Wheatley; Geo. Purdy, New Liberty; E. E. Bickers, Eminence; F. D. Hancock, Sulphur; W. W. Leslie, New Castle; Sam Brown, Ghent; Owen Carroll, New Castle.

H. R. Holmes, President of the Society, made a statement regarding the organization of the Fifth District Medical Society. The District is composed of the counties of Jefferson, Shelby, Franklin, Oldham, Trimble, Carroll, Gallatin, Owen and Henry. Each doctor who is a member of the County Society is a member of the Fifth District Medical Society and is cordially invited to participate in its activities and attend its meetings. The Society is run without dues and each member pays his personal expenses.

The first paper was read by Dr. Jno. R. Wathen, subject: "What the General Practitioner Should Know Concerning the Diagnosis and Treatment of Goitre." Discussion was opened by J. Duffy Hancock. The paper was also discussed by W. E. Fallis, W. I. Hume, A. D. Wilmouth, emphasizing the care and treatment of patients who, for any reason, will not accept an operation. L. Lyne Smith concerning the care of hyperthyroid patients with diabetes; by W. B. Troutman, particularly as to the heart; W. W. Leslie, reporting a case of interest.

The second paper was read by E. S. Allen of Louisville. Subject: "Local Anesthesia." Discussion opened by W. I. Hume. Paper discussed by G. C. Hall, W. E. Fallis and D. Y. Keith. Dr. Allen closing.

The third paper was read by A. M. Lyon of Frankfort. Subject: "Sterilization for Human Betterment." This paper brought forth a general discussion, with not much unity of opinion on the subject.

An excellent luncheon was served and a general good time was had by all.

The Fifth District Medical Society should be one of the best in the State and its officers are making an effort to that end. We insist that every physician in the Fifth District attend our November meeting and we cordially invite doctors from any other Districts.

Each member will be notified of the date of the November meeting.

OWEN CARROLL, Secretary.



# KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. 30 No. 9

BOWLING GREEN, KY.,

SEPTEMBER, 1932

## CERTIFICATES FOR BARBERS AND BEAUTICIANS

Under the new law requiring registration of barbers and beauticians, a certificate from a registered physician is required that the applicant is free from contagious and communicable diseases. In this requirement is found probably ninety per cent of the value of this law. The manner in which these examinations are made will determine the value of the certificates under it.

Each applicant should be given a general physical examination and should be especially examined for skin diseases, including those of the scalp. No certificates should be issued without procuring a negative Wassermann. Examinations for gonorrhea should include microscopic smears. Of course, every physician will realize his responsibility under this law. Our attorneys advise us that there is no question but that a physician, in giving a certificate of freedom from contagious and communicable diseases to an applicant that he has not carefully examined, would be liable in personal damages by any person infected by such a barber or beautician.

This matter of certification is not only of importance in the barbers' and beauticians' law, but is of general importance. A certificate of freedom from disease should never be given to anybody without the careful examination that will enable the responsible physician to really be as sure of his facts as modern science makes possible.

## GOLF TOURNAMENT

A golf tournament is planned and members may play from Saturday through Wednesday. As usual, arrangements will be made so members may play at any of the clubs though it will be necessary for the Tournament to be held at one designated club.

Final arrangements will be announced in the annual number of the Journal and will also appear in the program.

To be eligible for prizes in low net score it will be necessary to have and present your club handicap.

Anyone desiring further information is requested to write to any one of the following committee: D. Y. Keith, chairman, D. B. Choate, E. Lee Heflin and John Stites.

## INTERNATIONAL MEDICAL ASSEMBLY

The International Assembly of the Interstate Post-graduate Medical Association of North America will be held in the Murat Theatre and Shrine Temple, Indianapolis, Indiana, October 24-28, 1932.

Many distinguished teachers and clinicians, who are world authorities in their respective fields, will appear on the program. In addition to the intensive clinical and didactic program, there will be comprehensive scientific and technical exhibits, which alone will be well worth the cost of a trip to Indianapolis. Special entertainment has been arranged for the ladies in attendance.

Members of the Kentucky Medical Association are extended a special invitation to be present. No one who can possibly arrange to attend this meeting can afford to miss it, for it is to be filled with the very latest and best to be obtained in scientific and clinical medicine.

A major list of the names of contributors to the program, together with other information, appears in the advertising section of this issue of the JOURNAL. Final program will be mailed upon request to any members of the medical profession after September 1st. Dr. William B. Peck, Freeport, Illinois, Executive Secretary, will supply any additional information desired.

## ARRANGEMENTS FOR THE LOUISVILLE MEETING

The arrangements for the annual meeting of the Kentucky State Medical Association at the Brown Hotel, Louisville, October 3-6, are practically completed.

The Scientific Program, which has been very carefully prepared by Doctors Philip Barbour and Orville Miller, will appeal to every physician interested in the modern advances in medicine.

We are fortunate in having two distinguished visitors. Doctor John Lovett Morse, of Boston, is one of the leaders in the group of physicians especially interested in pediatrics and is one of the most interesting medical speakers in this country. Doctor Ira V. Hiscock, of New Haven, a member of the faculty of Yale, who will speak at the

Dinner meeting, will provide a rare treat for those who hear him.

The council has requested the Jefferson County Medical Society, which will have charge of the arrangements, to omit all entertainments. The dinner on Wednesday evening will be a mutual affair where every member will have the privilege of paying for himself and his guest.

Headquarters will be at the Brown Hotel, which has arranged special rates for the meeting. All of the sessions will be in the Roof Garden and the exhibits will be in the rooms just in front of it. The exhibits this year promise to be unusually interesting and valuable.

Doctor Guy Aud, president of the Jefferson County Medical Society, is general chairman of the Committee on Arrangements. The members of the various committees will be found under Official Announcements and their names will assure to those in attendance a successful meeting.

We desire to call the particular attention of the members to the program for Thursday. This will consist of a series of lectures on recent developments in medicine by members of the faculty of the University of Louisville. This innovation, which has been carefully prepared by Doctors Barbour and Miller will, we believe, appeal to every member of the association. It is to be thoroughly practical and will be valuable to every one of us who hear it.

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#### DR. HOWARD A. KELLY

We are fortunate in having Dr. Howard A. Kelly, Baltimore, as one of the distinguished guest speakers at the approaching Louisville Meeting. Dr. Kelley will deliver an address entitled "Other Foundation Can No Man Lay" on Sunday evening, Oct. 2, at the Warren Memorial Church, Fourth and Broadway. A union meeting of the churches will be arranged, under the auspices of the Louisville League of Christian Physicians. This meeting will be in honor of the faithful service which the physicians of our State have rendered to humanity during these dreadful days of want, poverty, and distress. While in Louisville, Dr. Kelly will address the Jefferson County Medical Society and will visit some of the rural health departments.

## SCIENTIFIC EDITORIAL

### OCULAR EXERCISES

Fads arise in medicine just as they do in styles of dress and social customs. Any department of medicine may be invaded. At present ophthalmology is in the throes of a fad for exercising the ocular muscles, not on the part of the medical profession but of the layman who has been misled by articles in lay magazines and by quack medical writings exploiting the abandonment of glasses and the promiscuous exercising of the muscles of the eyes for the relief of all kinds of symptoms. The layman has evidently been much impressed with the idea for hardly a day passes in the practice of the oculist that he is not interrogated regarding the advisability of exercising the muscles of the eyes regardless of the complaint of the patient or of the prevailing pathology.

We do not wish to discredit the importance of studying the function of the ocular muscles, nor do we wish to create the impression that all cases of eye strain can be relieved by the wearing of glasses. However, it is evident that the use of glasses by the nearsighted individual to bring up his visual acuity, by the presbyope to make reading and other close work possible, and by those with astigmatic eyes to improve vision and relieve reflex symptoms is as essential to comfort and efficiency as a motor is in propelling a car or a plane.

The association between muscle imbalance and asthenopia has been recognized ever since ophthalmology has been practiced as a specialty. Donders of Utrecht, Holland, who is known as the father of refraction, recognized in the defective ocular muscles one of the chief sources of eye strain a century or more ago.

When the writer was taking his early training in ophthalmology, courses in muscle study were being conducted in this country by Duane and others, with the result that exercises of the ocular muscles with prisms and other means applied judiciously and in a discriminating way have been for many years and continue to be employed by oculists who have had a diversified training in their special line of medicine.

Specialists are recognizing more and more the fact that comfortable binocular single vision can only be obtained and maintained by having parallel visual axes and that functional neurological disturbances are not all due to uncorrected errors of refraction, but that disorders of the neuro-muscular apparatus of the eyes play an important part in their etiology. It is not uncommon to bring about relief in patients of this kind by the



employment of orthoptic functional measures and stereoscopic and prism exercises.

It may, perhaps, be true that ophthalmologists in their overenthusiasm in the use of correcting glasses have, at times been guilty of overlooking other factors or of investigating the muscle balance in a half-hearted way. At any rate we can not go amiss by following the cue of the laymen's fad in giving the nervous patient with multiple eye symptoms the benefit of a careful study of his oculo-motor apparatus.

ADOLPH O. PFINGST.

#### OFFICIAL ANNOUNCEMENTS

Dr. Guy Aud, President of the Jefferson County Medical Society, has appointed the following Committees for the Louisville Meeting of the Kentucky State Medical Association. The Committee on Arrangements is formed from the Chairmen of the various Committees.

##### RECEPTION COMMITTEE

Dr. C. W. Hibbitt, Chairman,

Dr. Irvin Abell, Dr. E. S. Allen, Dr. C. G. Arnold, Dr. F. C. Askenstedt, Dr. W. F. Bog-gess, Dr. J. A. O. Brennan, Dr. Geo. S. Coon, Dr. S. G. Dabney, Dr. Nora D. Dean, Dr. Wm. B. Doherty.

Dr. C. W. Dowden, Dr. W. C. Dugan, Dr. Wm. E. Fallis, Dr. J. A. Flexner, Dr. Louis Frank, Dr. Guy P. Grigsby, Dr. D. P. Hall, Dr. C. H. Harris, Dr. G. A. Hendon, Dr. Claude G. Hoffman, Dr. R. L. Ireland, Dr. S. C. McCoy.

Dr. John J. Moren, Dr. Curren Pope, Dr. J. B. Richardson, Dr. D. Y. Roberts, Dr. Vir-gil E. Simpson, Dr. Leon L. Solomon, Dr. Ed-ward Speidel, Dr. E. O. Witherspoon, Dr. W. J. Young, Dr. B. F. Zimmerman.

##### FINANCE COMMITTEE

Dr. J. B. Lukins, Chairman,

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Dr. Charles M. Edelen, Dr. J. Duffy Han-cock, Dr. H. H. Hagan, Dr. Henry C. Herr-mann, Dr. E. F. Horine, Dr. C. W. Karraker, Dr. J. Paul Keith, Dr. Ira N. Kerns, Dr. J. Allen Kirk, Dr. Hugh R. Leavell.

Dr. A. M. Leigh, Dr. James S. Lutz, Dr. E. K. McLain, Dr. Wm. H. McClarin, Dr. Lamar W. Neblett, Dr. O. R. Reesor, Dr. H. C. T. Richmond, Dr. Frank Stites, Dr. C. Dwight Townes.

##### ENTERTAINMENT COMMITTEE

Dr. W. Hamilton Long, Chairman,

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Dr. Ellis Duncan, Dr. G. L. Dyer, Dr. Henry J. Farbach, Dr. Morris Flexner, Dr. Wallace Frank.

Dr. Owsley Grant, Dr. G. C. Hall, Dr. W. I. Hume, Dr. Lee Kahn, Dr. J. Murray Kins-man, Dr. O. O. Miller, Dr. J. Rowan Mor-ri-son, Dr. H. V. Noland, Dr. W. A. Onder-donk.

Dr. W. Barnett Owen, Dr. A. O. Pfingst, Dr. Henry M. Rubel, Dr. J. Garland Sher-rill, Dr. L. P. Spears, Dr. R. G. Spurling, Dr. John R. Wathen, Dr. Claude T. Wolfe.

##### GOLF TOURNAMENT COMMITTEE

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Dr. Ben D. Choate, Dr. E. Lee Heflip, Dr. John Stites.

##### PUBLICITY COMMITTEE

Dr. S. C. Frankel, Chairman,

Dr. Harry S. Frazier, Dr. Sam P. Myer, Dr. Malcolm Thompson, Dr. John D. Tra-wick, Dr. W. B. Troutman, Dr. Thos. K. Van-zandt.

##### COMMITTEE ON PLACE OF MEETING

Dr. W. E. Gardner, Chairman,

Dr. W. F. Alvey, Dr. Frieda Berresheim, Dr. Mischa Casper, Dr. O. H. Kelsall, Dr. Geo. C. Leachman, Dr. A. W. Nickell, Dr. Orville R. Miller, Dr. John Walker Moore.

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Dr. Lee Palmer, Dr. Harry J. Phillips, Dr. James H. Pritchett, Dr. M. H. Pulskamp, Dr. Frank Ritter, Dr. Geo. F. Simpson, Dr. Shelton Watkins, Dr. A. D. Willmoth, Dr. C. Brooks Willmott.

##### COMMITTEE ON ARRANGEMENTS

Dr. Guy Aud, Chairman,

Dr. S. C. Frankel, Dr. I. T. Fugate, Dr. W. E. Gardner, Dr. C. W. Hibbitt, Dr. D. Y. Keith, Dr. Fred L. Koontz, Dr. W. Ham-ilton Long, Dr. J. B. Lukins, Dr. E. R. Pal-mer.

**OFFICIAL ANNOUNCEMENTS**

PRELIMINARY PROGRAM KENTUCKY STATE  
MEDICAL ASSOCIATION, BROWN HOTEL  
October 3-6, 1932

**GENERAL MEETINGS**

TUESDAY, OCTOBER 4TH, 9 A. M.

Call to Order by the President.

Invocation.

Address of Welcome.

Response Address of Welcome.

Installation of President.

1. Acute Gall Bladder Disease, W. H. Smith, M. D., Danville.

2. Relief of Prostatic Obstruction Through the Urethra, E. Owsley Grant, M. D., Louisville.

3. The Treatment of Compound Fractures, C. R. Petty, M. D., Lynch.

4. Treatment of General Infectior with Blood Transfusion, Walter I. Hume, M. D., Louisville.

SPECIAL ORDER AT 12 M.

**ORATION IN SURGERY**

The Epileptic Problem, R. Glen Spurling, M. D., Louisville.

TUESDAY, 2 P. M.

1. Relative Value and Dangers of Spinal and Inhalation Anesthesias, Uly H. Smith, M. D., Louisville.

2. Diverticulitis with Report of Unusual Case, Joseph M. Frehling, M. D., Louisville.

3. Lung Abscess and Its Treatment, Oscar Miller, M. D., Louisville.

4. Stricture of the Urethra in the Female, W. T. Briggs, M. D., Lexington.

PUBLIC MEETING AT 8:00 P. M.

CRYSTAL BALL ROOM

TUESDAY, OCTOBER 4TH

President's Address, Philip F. Barbour, M. D., Louisville.

Annual Oration, John Lovett Morse, M. D., Boston, Mass., President, American Academy of Pediatricians.

WEDNESDAY, OCTOBER 5TH, 9 A. M.

1. Case Reports (Limited 8 minutes each)  
a. Carotinemia, Winston U. Rutledge, M. D., Louisville.

b. Bronchiectasis, J. W. Scudder, M.D., Calhoun.

c. Leprosy in Kentucky, Lillian H. South, M. D., Louisville.

2. Diagnosis and Treatment of Empyema of Childhood, Clark Bailey, M. D., Harlan.

3. Malpractice Suits, J. B. Lukins, M. D., Louisville.

4. Symposium on Anemias (Limited 10 minutes each).

Diagnosis and Treatment of:

a. Eczema, Robert Keily, M. D., Louisville.

b. Agranulocytosis, Carl H. Fortune, M. D., Lexington.

c. Lymphatic Leukemia, Thomas J. Marshall, M. D., Paducah.

d. Indications In Anemia for Surgery of the Spleen, Austin R. Quigley, M. D., Maysville.

SPECIAL ORDER AT 12 M.

**ORATION IN MEDICINE**

Chronic Hypochromic Anemia, Charles N. Kavanaugh, M. D., Lexington.

WEDNESDAY, 2 P. M.

1. Allergy, Armard E. Cohen, M. D., Louisville.

2. Calcium Metabolism in Health and Disease, James E. Winter, M. D., Louisville.

3. Relation of Ear, Nose and Throat to General Infectious Disease, A. L. Bass, M. D., Louisville.

4. Symposium on Obstetrics (Limited 10 minutes each)

a. Pregnancy and Its Complications, L. C. Redmon, M. D., Lexington.

b. Labor and Its Complications, B. S. Rutherford, M. D., Bowling Green.

c. Puerperium and Its Complications, N. C. Witt, M. D., Franklin.

WEDNESDAY, 6:30 P. M.

Banquet, Brown Hotel

**ADDRESSES**

Ira V. Hiscock, Professor of Public Health, School of Medicine, Yale University, New Haven, Connecticut.

Mrs. Charles E. Oates, President, Woman's Auxiliary to the Southern Medical Association, North Little Rock, Arkansas.

Mrs. Walter Jackson Freeman, President, Woman's Auxiliary to the American Medical Association, Philadelphia, Pennsylvania.

THURSDAY, OCTOBER 6TH, 9 A. M.

CONDUCTED BY THE UNIVERSITY OF LOUISVILLE  
(Limited 10 minutes each paper.)

1. Radical Treatment of Joint Tuberculosis, R. L. Woodard, M. D., Louisville.

2. Clinical Instruction in Dermatology and Syphilology at the University of Louisville, C. B. Willmott, M. D., Louisville.

3. Studies on Circulation, J. M. Kinsman, M. D., Louisville.

4. Clinical Progress in Obstetrics, Edward Speidel, M. D., Louisville.

5. Subject Unannounced, John J. Moren, M. D., Louisville.

6. Surgical Complications in Pneumonia, L. Wallace Frank, M. D., Louisville.

THURSDAY, OCTOBER 6TH, 2:00 P. M.

1. Some Causes of Blindness, Claude T. Wolfe, M. D., Louisville.

2. Varicose Veins of the Broad Ligament as Cause of Pelvic Discomfort, Charles W. Hibbitt, M. D., Louisville.

3. Some Practical and Theoretical Points in Oxygen and Carbon Dioxide Therapy, W. Hamilton Long, M. D., Louisville.



4. The Ano-Rectal Abscess, Bernard Asman, M. D., Louisville.
5. Recent Developments in the Department of Psychiatry, W. E. Gardner, M. D., Louisville.
6. Recent Developments in Pediatrics, James H. Pritchett, M. D., Louisville.
7. Prognosis of Para-nasal Sinus Disease, Walter Dean, M. D., Louisville.

### ORIGINAL ARTICLES

#### SCARLET FEVER—OBSERVATIONS ON CONTROL METHODS AS APPLIED IN HARRISON COUNTY\*

R. W. BALL, M. D.

Cynthiana.

In the past, the methods used in controlling Scarlet Fever have consisted largely of quarantine of cases and immediate contacts and, in the presence of epidemics, closing the schools. The mere quarantine of an infected family will, of course, remove one source of infection from the community; but no protection is thus afforded the immediate contacts in the school. A number of carriers or potential new cases are left to constitute a menace to the public. The present use of school busses, in many instances, really means closer contact with the developing case than that into which those in the prospective patient's immediate family are brought. The result is that after the patient is quarantined, along with the rest of the family, new cases may continue to arise, here and there, as the result of recent contact with his other school-mates.

Several new cases are then reported and, foreseeing a wave of scarlet fever passing over the school, no alternative is left under the old plan, but to close the school for two weeks or more. The teachers' salaries must continue regardless, adding to the financial burden of the county; the time lost must be made up during the school term or at the end of the year; and many children harboring the organisms of scarlet fever in their throats are allowed to return home, unrestricted, to carry the infection at will to any part of the county—attending motion picture theatres, churches, miscellaneous gatherings, or even visiting other schools. In the meantime, we merely stand by and wait for new cases to develop.

Last fall (starting in October, 1931) just such a train of developments took place in the northern part of Harrison County.

Twenty or more cases occurred over a period of six weeks, resulting in two deaths. Each case was quarantined as soon as reported, but, since a new case would appear every few days in spite of our quarantine, there was, so far as we could see, no alternative except to close the two schools affected (Berry and Antioch) for a period of two weeks. After closure, there were, fortunately, no new cases reported. I have since been advised that the same procedure had to be resorted to the year before at another school (Buena Vista).

In anticipation of probable outbreaks in other parts of the county, something had to be done. The excellent work done at Berea College a few years ago was recalled to mind, and, at our request, the State Epidemiologist came over and gave an illustrated lecture to our County Medical Society on "Modern Scarlet Fever Control Methods," including quarantine of case, isolation of immediate contacts, restriction of carriers, Dick testing, and immunization of susceptible individuals. The doctors of our county, including myself, had, up to this time, felt rather unfavorable toward scarlet fever immunization, for the very good reason that in the past our experience with immunizing preparations had, for the most part, resulted in severe reactions and conferred very little immunity. The arguments of our epidemiologist, however, appeared logical and his results were convincing. So we agreed to give it a try.

On December 3, 1931, our program was started by making the Dick test for susceptibility on 406 volunteer pupils at Marshall and Berry Schools, these two being the largest in the county. Out of 176 pupils at Marshall, 57 per cent gave positive reactions, and of 230 at Berry, 30 per cent were positive. The parents of these children were promptly notified of our results, with recommendation that the susceptible children be taken to the family physician at once for immunization. Physicians of the town and county were then furnished with immunizing toxin.

On Saturday, January 16, 1932, a case of scarlet fever was reported at Poindexter and was promptly quarantined. Monday, the 18th, the parents of all children at Poindexter school were sent letters, advising them of the Dick test to be made the following day. Tuesday, 45 of the 72 pupils present were Dick tested. Throat cultures were made on every child in the school for the detection of hemolytic streptococci. Of the 45 who were Dick tested, 27 were found to be susceptible, and most of them were started immediately on immunization. Of 75 throat cultures, 23 were found to be positive. Through the co-operation of the school authorities, these 23 children were promptly sent home and iso-

\*Read before the School for City and County Health Officers, Lexington, 1932.

lated, the school bus making a special trip for this purpose. Follow up visits to the homes of these 23 carriers were made and additional cultures taken during the next several days by members of the Health Department, each child being allowed to return to school as soon as his throat cleared up. No new cases have subsequently been reported.

At Oddville, where the school bus from Poindexter terminates, the school was Dick tested a few days later. There were no cases at this school, but its schoolbus connections with Poindexter warranted preparedness. Out of 104 pupils Dick tested, 53 per cent reacted positively, some of whom were later immunized.

Attention was next directed to the County Infirmary, (Poor Farm) when a case of scarlet fever was found in a girl of 16 years who worked on the place. She and her two roommates, who were elderly women, were isolated. Throat cultures on the other inmates were not made because their advanced ages rather minimized the probability of being infected. As a matter of routine, however, the other inmates (all over 50) were Dick tested, and all were negative. Needless to say, no new cases occurred.

Toward the end of February, word came that a child at Sunrise school was thought to have had a light attack of scarlet fever the week before, although no report had previously been made to the Health Department. When I saw this child she had completely recovered from whatever illness she may have had, and no diagnosis could be made. Two weeks later, March 1, her sister developed a typical case of scarlet fever, and was, accordingly, quarantined. The next day it was also learned that two of the teachers had been absent from school for several days with severe sore-throat, which, upon investigation, was found to have started over three weeks before—and nothing had ever been said about it. These teachers were visited at their home and throat cultures made. One was found to have a discharging ear and a culture was made from the discharge, which, upon laboratory examination, showed the presence of hemolytic streptococci, but the throat culture was negative. The throat culture from the other teacher was positive.

On March 2, Dick tests and throat cultures were made on all students at Sunrise school. Of 105 Dick tests, 28 or 27 per cent gave positive reactions, and immunization was started immediately. Of the throat cultures, 44 per cent showed the presence of the scarlet fever organism, giving us, for the moment, another cause for concern, inasmuch as that indicated 50 carriers in the school.

To close the school would have defeated our objective and accomplished nothing; to send home and isolate all the carriers would have meant taking out one-half of the pupils and demoralizing the other half. Furthermore, it would not have been possible, with the limited personnel in our department, to follow up in the home such a large number of carriers. The school was, therefore, allowed to continue without further interruption. There have been subsequently no new cases reported.

On the night of March 2nd, two cases of scarlet fever were reported from St. Edwards school, a small school in Cynthiana of about 30 pupils. Treating this as an emergency, the Dick test was waived and immunization was started at once on every pupil who gave a negative history of scarlet fever. In view of the immediate immunization procedures, throat cultures were not made. At the same time, immunization was started on the immediate contacts in the homes of the two cases. In case No. 1 both contacts, ages 3 and 6 years, respectively, developed mild cases of scarlet fever after having received 750 units each of immunizing toxin. In case No. 2 there were also two young contacts, ages 2 and 4 years, respectively. These two children were also started promptly on active immunization and neither developed symptoms of the disease. Also, no new cases developed in the school.

On March 4 a boy of 12 years, from the Cynthiana High School presented himself at our office for examination, complaining of sore throat and giving a history of recent exposure to a case of scarlet fever. A throat culture was taken and he was sent home and isolated. Next morning the culture showed the presence of hemolytic streptococci; the home was quarantined, and the now conventional order of Dick testing and immunization proceeded at the high school. The case developed no further symptoms and the throat cleared in a few days. No new cases have been reported.

At the Harrison Memorial Hospital (30 beds), on March 25, one of the pupil nurses developed a very typical case of scarlet fever and was placed in strict isolation. The eight other nurses at the hospital were throat cultured and Dick tested and the resulting five susceptibles were immunized. The hospital patients at this time were mostly elderly persons, and the only two under the age of 50 years gave negative Dick tests. Except in emergency cases, all subsequent patients were Dick tested before admission. Frequent throat cultures on the nurses showed variations in the presence of the organisms—present one time and absent another, and vice versa. An interesting fact was brought



out in that the nurse who developed scarlet fever had not been in contact with any other known case, but, for several days, had been more or less specializing on an obstetrical case in the hospital. Investigation revealed that the obstetrical case had come from Sunrise (where we found our high percentage of carriers.) A throat culture on this parturient showed the presence of hemolytic streptococci—pointing to a rather obvious and quite logical conclusion. No further cases developed in the hospital.

On April 18, the principal of Indian Creek School reported an alleged case of scarlet fever in the pre-school brother of one of her pupils. Investigation confirmed the diagnosis. Next morning the Dick testing and immunization procedure was started in the school. While at the school a girl of 16 years was observed to have a fine papular rash over both forearms and complete desquamation of the palms. She stated that she had had "influenza" two weeks before and had been back in school for a week. Her Dick test proved negative, but a throat culture was positive for hemolytic streptococci. Upon quarantining the home, which was done immediately, it was learned that three other children in the same household had recently had a similar rash and desquamation. One of these was now suffering from a peritonsillar abscess, a common complication. The family insisted that all of the children had had severe cases of scarlet fever several years ago, and this statement was confirmed by two reputable physicians. The first immunization was given at the school on April 19 and subsequently completed. No further cases have been reported.

Summarizing, we had last fall an epidemic of 20 or more cases of scarlet fever in one section of the county, which, by use of the old methods, was not controlled, ultimately necessitating the closing of two schools. During the first four months of this year, we had cases reported from each of five schools, the County Infirmary, and the County Hospital. At each of these seven institutions the more modern control methods were instituted, without the occurrence of further cases.

#### THE DICK TEST

The Dick test consists of the intradermal injection of 0.1 cc. of diluted scarlet fever toxin into the skin of the forearm. In susceptible individuals, an area of redness appears at the site of injection, varying in size from 10 mm to 35 mm or more (or from one-half the size of a dime to that of a fifty-cent piece), and in color from a faint pink to a bright red. In highly susceptible individuals, there may also be some degree of localized swelling. The local reaction reaches its

maximum in about 24 hours, after which it fades out rapidly.

This test is of value in determining either immunity or the degree of susceptibility of an individual. It is also of diagnostic value in ruling out scarlet fever and, later, may establish reasonable assurance (if not actual proof) of having had the disease. This test is especially helpful in that questionable group of individuals with only light attacks, the ambulant sore-throats.

This was well illustrated in a boy of 6 years who was Dick tested at Poindexter School, along with the others on January 18. He did not return to school the next day because of a sore throat and moderate fever, and a visit to the home revealed a positive Dick test. Suspecting scarlet fever, we duly quarantined the boy. Throat culture showed presence of hemolytic streptococci. Next day he had apparently recovered and there were no further symptoms—no rash, no strawberry tongue, no desquamation, but he was kept under quarantine for three weeks. Two weeks from onset his Dick test was still positive. Two months from onset the Dick test was found to have become negative.

During our institutional investigations from January 1 to May 1, 825 persons, ranging in age from 6 years to over 50 years, were Dick tested. Of the total number, 43 per cent reacted positively. Of the 353 positives, 88 per cent were between the ages of 6 and 15 years.

The degree of susceptibility does not appear to be necessarily proportionate to the age of the individual, as we noticed that some of our most marked reactions were in persons 28 and 30 years of age; whereas, in the lower school grades, many of the positive reactions were very slight. Also, one of our severest cases of scarlet fever was in a patient of 28 years.

Of 47 cases reported between August 1, 1931, and May 1, 1932, 49 per cent were between the ages of 6 and 10 years. Below is table showing number and percentage of cases according to age groups:

Age	Percent
Under 1 year (1)	
2-5 years	17
6-10 years	49
11-15 years	19
Over 15 years	16

#### IMMUNIZATION

The State Board of Health of Kentucky furnishes to its health officers and practicing physicians a preparation of scarlet fever toxin for active immunization, in a series of five doses, to be injected subcutaneously at weekly intervals. Active immunity is said

to commence with the first injection. The concentration of each successive dose is increased according to a definite scale. The toxin is put up in five vials and the number of the dose indicated on the label. The dosage recommended is as follows:

Dose No. 1 .....	1cc.....	500 units
Dose No. 2 .....	1cc.....	2000 units
Dose No. 3 .....	1cc.....	8000 units
Dose No. 4 .....	1cc.....	25000 units
Dose No. 5 .....	2cc.....	80000 units

The local and systemic reactions following the administration of the toxin have been found to appear in direct proportion to the degree of reaction to the Dick test; therefore, where a markedly positive Dick test is found, it has been suggested that for the first dose only 0.5cc (250 units) be given, and a week later the full first dose, making six injections in all.

In Harrison County we started out by following this plan to the letter, governing our first dose by the reaction to the Dick test. We found that, in a great many instances, in giving 500 units when the Dick test was not unusually positive, we occasionally still had rather severe reactions—locally, with painful, red, swollen arms; and, systemically, with fever, occasional vomiting, and sometimes a generalized rash. These symptoms lasted from 24 to 36 hours. In view of this, we then changed to a routine of only 0.5cc (250 units) as a preliminary dose, followed a week later by the regular series beginning with 500 units, thus making a total of six injections. While there is always some degree of local reaction, the injections do not, as a general rule, appear to inconvenience the patient to any great extent. This, however, varies somewhat with the individual.

The Dick test appears to be a fairly accurate gauge in determining the amount of immunizing toxin necessary to establish immunity. In our first groups, we gave the whole series of six doses; but later commenced Dick testing one week after the fourth injection, that is, after 10,750 units. In a series of 97 cases with positive Dick tests we found that 94 per cent of them became Dick-negative after the fourth injection.

Number of persons given Dick test.....	825
Number giving positive Dick reactions 353	
(43 per cent)	
Number given scarlet fever toxin.....	97
Number Dick-negative after 4 injections 91	
(94 per cent)	

In every case where six injections were given the Dick test was found to have become negative from one to two weeks after the series was completed.

## CONCLUSIONS

1. That the carrier is an important factor in the transmission of scarlet fever and that there exists a far greater number of healthy carriers than most of us realize. This has been well illustrated in throat culturing in schools.

That practicability of isolation and restriction of carriers depends usually upon local conditions; the number of persons in a given group (as in schools), the number of carriers in the group, the number of susceptible contacts, the number of workers in the department enforcing isolation, and the degree of education and cooperation of the people in the affected community.

2. That the Dick test is of value in identifying susceptible individuals and in determining the degree of susceptibility; that it may serve as a guide to the amount of toxin necessary to establish immunity; that it is of value in ruling out scarlet fever and establishing evidence of having had the disease.

3. That the use of scarlet fever toxin will establish immunity and that in over 90 per cent of cases the Dick test will become negative after four injections (10,750 units).

4. That a routine of 0.5cc (250 units) as a first dose, instead of 1cc (500 units), will minimize the severity of the initial reaction.

5. That a routine of six doses out of five bottles of different concentrations leads to a certain amount of confusion; whereas, if the doses were put up in six bottles instead of five, this confusion would be eliminated.

6. That if a negative Dick test were added to the list of Blue Ribbon requirements for school children, the prevalence of scarlet fever in the schools would be markedly reduced. The same would apply to infants and pre-school children.

7. That if a negative Dick test were required of hospital personnel we would be relieved of the potential embarrassment of a possible case of such an obviously preventable disease in our institutional workers. This applies also to all workers in the field of Public Health.

8. That the systematic use of the Dick test, plus immunization—places the whole procedure upon an accurate scientific basis.

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**Late Results of Cardiac Suture.**—Rufanov reports the clinical history of a man, aged 44. Examination revealed a scar in the region of the heart, through which the cardiac movements could be observed. A scar in the back indicated a previous resection of a rib, and the anamnesis revealed that twenty-eight years before the patient had suffered an injury of the heart which necessitated cardiac suturing.



## ACUTE NEPHRITIS\*

M. E. LOFTUS, M. D.

Glasgow

Like many other organs the kidney is liable to be affected by acute and chronic diseases. From the point of view of the clinician perhaps the most interesting symptoms are those seen in severe acute nephritis. Here the kidney tissues may be compared with a pneumonic lung, and the whole of the kidney function is for the time being thrown more or less out of action. In consequence there is a failure to eliminate nitrogenous waste products with the result that these bodies accumulate in the blood. Little, or no, sodium chloride is present in the urine, and water which should be eliminated is retained in the body, giving rise to edema and dropsy.

The acid eliminating function of the kidney fails to fulfill its purpose, and the retained acid products tend to upset the normal mechanism for the regulation of the blood reaction. This condition generally persists for some time, but sooner or later, in favorable cases, the renal cells recover their function to some extent, and marked general improvement sets in. All the features of renal deficiency are most conspicuous in acute disease, but the same manifestations, though in a modified degree, are present in chronic disease, and as far as the kidney is concerned many of the symptoms of acute nephritis differ only in degree from those of chronic nephritis.

Acute nephritis is the result of some infection, usually the upper respiratory tract; often following an attack of scarlet fever or a septic sore throat. A very high grade of nephritis is often encountered during the treatment of a case of diabetic coma; severe burns of the skin and the ingestion of large amounts of the salts of mercury and uranium are also capable of producing nephritis by their toxic action on the renal cells. Acute nephritis as it presents itself to the practitioner is a syndrome comprising one or more of the following features: Albuminuria, haematuria, edema, moderate hypertension if edema is evidenced, and a group of phenomena described as uremia. There are many other signs and symptoms seen in nephritis, but those mentioned are the cardinal ones on which the diagnosis is based. Among the other symptoms often present are: general malaise, headache, dyspepsia, vomiting or extreme nausea, pain in lumbar region, fever, changes in the urine and blood, vascular changes, eye changes.

It is possible to separate from the confused mass of pathology in nephritis, two diseases which may usefully be taken as the two extremes between which all other categories of Bright's Disease must be included. At the one extreme is lipoid nephrosis, clinically distinguished by intense albuminuria and a massive anasarca without the slightest sign of cardio-vascular change, arising insidiously, chronic but benign in course exhibiting little change in the blood except Hyper-cholesterolemia, and producing apparently no anatomical change in the kidney except a tubal degeneration which is in many cases a transient occurrence. The disease is probably of metabolic origin and its renal manifestations are not more than a trivial part of the picture. At the other end of the scale is arterio-sclerosis the arterio-capillary fibrosis of Gull and Sutton. This is believed to begin as a generalized spasm of the arterioles producing in its earlier stages high blood pressure along with a compensatory hypertrophy of the heart. This disease may produce no demonstrable renal effects whatever and it is only in a certain proportion of all cases that the kidney tissues suffer sufficiently for renal failure to become manifest. To classify such cases under the heading of chronic interstitial nephritis would appear grossly unscientific. Between these two extremes are to be found that large group of cases now usually referred to as glomerulo-nephritis in which the pathologist can invariably demonstrate morbid changes in the kidney, such changes being due to bacteria or other toxic substances and giving perhaps valid reason for regarding the kidney as the organ which has principally suffered in a disease which is blood born in its origin.

In glomerulo nephritis, whether chronic or acute, both edema and hypertension are almost invariably present at some time. In chronic cases hypertension is accompanied by cardiac hypertrophy, although the cardio-vascular phenomena are seldom prominent as they are in cases of primary arterio-sclerosis. Haematuria and casts of the renal epithelium are usually accompaniments of acute attacks and supply evidence of the active inflammatory process in which the kidney is involved.

## CLASSIFICATION OF NEPHRITIS

## A. THE NEPHROSES

1. Lipoid nephrosis
2. Chemical nephropathies
3. Amyloid Disease

## B. GLOMERULO-NEPHRITIS

1. Acute diffuse glomerulo nephritis
2. Chronic diffuse glomerulo nephritis
3. Focal glomerulo nephritis
4. Embolic glomerulo nephritis

\*Read before the Barren County Medical Society, June 22, 1932.

## C. ARTERIOLO-SCLEROSIS

1. Pre-nephritic stage, (essential hypertension)
2. Later stage with cirrhosis of spleen and kidneys; renal failure, the so-called (chronic interstitial nephritis)
3. The malignant renal sclerosis of Fahr. Marked renal cirrhosis.

Uremia is of fairly frequent occurrence during acute stages, and may occur as a final event in chronic cases where repeated inflammation has brought about permanent renal failure.

It is now recognized that glomerulo-nephritis may occur in several forms, to which reference will be made later; and there is in addition an embolic type of glomerulo-nephritis which occurs in conjunction with sub-acute bacterial endocarditis and is seen in no other cases. Summarizing the above paragraphs we see that a classification of nephritis to be in accordance with modern knowledge must be elaborated from the following three main categories: (a.) The so-called Nephroses. (b.) The glomerulo-nephritides. (c.) Arteriole-Sclerosis, with its renal manifestations. If we proceed from this simple basis, we can distinguish various sub-divisions on the following lines:

## DETAILED CLASSIFICATION

## The Nephroses:

1. Lipoid nephrosis; probably a general disorder of metabolism, characterized by abnormal permeability of the cutaneous and renal vessels for albumin and lipoids. Massive albuminuria. Entire absence of cardiovascular changes.

2. Nephropathies: Produced by poisons such as corrosive sublimate, uraneum and the chromates. Lesions almost entirely confined to the tubules. Edema and albuminuria without vascular changes, usually followed by complete healing with return of renal function. In very rare cases leading to permanent damage and secondary contraction of the kidney.

3. Amyloid disease: Falls into this class but need not be discussed here

## GLOMERULO-NEPHRITIS

1. Acute diffuse glomerulo-nephritis: The classical nephritis appearing in the later weeks of an infectious fever. All the glomeruli are affected, the primary lesion being an acutely progressive swelling of capillary endothelium of the glomeruli together with an accumulation of large numbers of leucocytes in the affected loops. Acute edema, sometimes acute dilatation of the left heart with an acute hypertonicity, albuminuria, hematuria, toxic lesions of the cutaneous and glomerular vessels. Uremia may occur, com-

plete resolution is possible, but more frequently extension occurs with a spread of the disease to the tubular apparatus, edema becomes conspicuous owing to lesions of the cutaneous capillaries, and the continued high blood pressure is followed by cardiac hypertrophy. If death occurs in any of the stages, post mortem appearance of the kidneys will range from a normal looking organ in which the microscope alone will reveal the disease of the glomerular capillaries, to a large smooth organ the size and palor of which may either or both of them be conspicuous, according to the degree that swelling of the epithelial cells, or interstitial edema, or fatty change, or hemorrhage into the renal substance may have predominated.

2. Chronic glomerulo-nephritis, secondary contraction of the kidney. Variable albuminuria, repeated attacks of so-called renal edema, moderate to marked elevation of the blood pressure, cardiac hypertrophy, progressive destruction of the kidney substance, usually ends in renal failure and death from uremia.

3. Focal Glomerulo-Nephritis: Occurring perhaps most frequently as a complication of tonsillitis, scarlet fever and other streptococcal infection; marked haematuria, slight albuminuria, no edema, no hypertension, benign in course, owing to the fact that a limited number of glomeruli only are affected. In very rare cases, sufficient destruction may be produced to lead to secondary contraction of the kidney, with a clinical picture not easily distinguished from the chronic diffuse glomerulo-nephritis.

4. Embolic Glomerulo-Nephritis: Of clinical interest as being the renal complication of infective endocarditis.

## ARTERIOLO-SCLEROSIS

1. Essential hypertension, spasm of the arterioles producing high blood pressure and later cardiac hypertrophy, a morbid change in the arterioles may progress to fibrosis, producing its maximum effects on the abdominal glands, particularly the spleen and kidneys, in which case the disease manifests itself as:

1. Granular atrophy of the kidneys, so-called chronic interstitial nephritis.

2. The malignant renal sclerosis of Fahr in which case the arteriole-sclerosis has produced marked renal cirrhosis.

The above classification of nephritis seems to comply both with existing clinical and pathological knowledge.

At the outset it is extremely important to form at least a working diagnosis along the lines indicated above, as to the exact nature of the disease; that is to say, whether it is acute or chronic, or if arteriole-sclerosis with



renal manifestation, and whether renal failure is present as transitory or as a permanent phenomenon. There are three chief manifestations of this disease to be combatted. First, actual or threatened uremia; second, Edema; third, Hypertension. The active treatment of acute nephritis reduces itself largely to the treatment of symptoms. There are no measures known to medical science that will directly influence the pathological changes in the kidneys; and all that can be done is to insure that the patient is placed under the most satisfactory conditions for recovery of the damaged renal cells.

The view is generally accepted that a diet low in protein is indicated in the early stages, especially in cases showing a retention of nitrogenous waste products in the blood. When this is a marked feature, a diet in which the necessary calories are furnished in the form of carbohydrates often does well. On the other hand, the mistake should not be made of unduly limiting the protein intake for long periods, in all instances in which there is marked albuminuria. For certain cases, often complicated by persistent edema, the amount of protein actually passed in the urine may be so great as to constitute a serious loss, and in such cases it is worse than useless to restrict protein intake. Very often we relieve the edema by greatly increasing the protein part of the diet; the action of which is dependent to some extent on the diuretic action of urea formed as the result of increased protein metabolism. In bad cases with severe general disturbance the amount and nature of the food must often be determined by the state of the patient's stomach. Sugar is exceedingly beneficial in the form of 50 per cent glucose in orange juice; if vomiting, give by vein, 25 per cent glucose in saline, 200 cc. with 20 U of insulin. When more food can be taken, the diet may be made up of milk sparingly with cereals and, after a few days, bread, butter and cooked rice with milk may be added. In very severe cases with marked edema it is a very good plan to keep the patient on a starvation diet for a day or two; this lowers the general metabolism of the body and provides functional rest for the damaged kidneys. Gradually as the edema disappears and symptoms become less urgent, more and more carbohydrates may be added to the diet. The fluid intake depends to a great extent on the amount of edema present, whether increasing or diminishing, the amount of urine secreted, the presence or absence of vomiting and other factors. In spite of restricted fluid intake and salt free diet, edema may prove very troublesome and persistent; in such cases fluid must be aspirated sometimes when there is excessive fluid

in the abdomen or chest. When fluid is being withdrawn from the chest it should be removed very slowly, for any sudden reduction of pressure may cause edema of the lungs. For ascites, a very good plan is to introduce a very small canula and let the fluid drain out very slowly into a bottle under the bed. Tapping of the legs should be avoided if possible on account of difficulty in healing and the tendency to become septic. One of the best means of dealing with edema is the free use of purgatives, if the stomach will tolerate them.

Diuretics seem to be of no value in acute nephritis. In this condition the renal cells are poisoned, and it is difficult to imagine how any substance could stimulate into activity these temporary inactive tissues. There success is almost entirely confined to cases of nephrosis or cardiac edema. In acute nephritis a condition accompanied by convulsions, and in certain respects somewhat similar to the uremia of chronic nephritis, is occasionally seen. This so-called "uremia," with convulsions appears to occur only when extensive edema is present, and is probably dependent on a local edema of the brain. These convulsions are sometimes preceded by a definite increase in the edema and a progressive rise of blood pressure with severe headache. As already indicated, they are not usually of serious import and are best treated by large doses of sedatives and cathartics or by venesection. If headache is severe, and blood pressure is rising, potassium bromide 15 gr. with chloral hydrate 10 gr., should be given every four hours until the blood pressure begins to fall. At the same time, free purgation should be induced by giving magnesium or sodium sulphate one or two ounces. Morphine in doses up to 1-4 grain may also be used. With the actual onset of convulsions, 30 grains of potassium bromide with 30 grains of chloride hydrate dissolved in two or three ounces of water should be given by rectum. If the convulsions are not very frequent this sedative may be given by mouth. When the convulsions are very frequent and severe a small amount of chloroform or ether may be necessary. By far the best treatment is the removal of 10 or 15 ounces of blood from the vein; lumbar puncture has frequently been employed and with fair results, but the procedure is usually unnecessary. In the pre-convulsive stage it sometimes precipitates the onset of convulsions, so that it should be performed only, if at all, after convulsions come on.

Usually venesection succeeds in the clearing up of the condition and generally the patient does quite well.

When the heart begins to show signs of

failure from increased blood pressure and general toxic condition, digitalis may be given with some benefit. If the stomach permits, 20 minims may be given every four (4) hours until signs of digitalization appear. If there is much cardiac distress, with right heart embarrassment, venesection is useful. The complete suppression of urine, which is sometimes seen, is merely an indication of the severity of the condition and can not be materially influenced by any therapeutic measure. Muscular twitching suggestive of tetany often complicates a case, especially one in which large amounts of alkalies have been administered during a case of fever or other acute infections, and usually suggests a calcium shortage and is often cleared up by the administration of 1 gr. Calcium Chlor. in 40 cc. distilled water, injected into the gluteal muscles every hour for four or five doses. In the treatment of all cases of nephritis, the greatest care should be taken to ascertain the presence of septic foci and to remove these conditions when possible. A sub-acute attack of nephritis may be cut short frequently by the removal of septic tonsils.

#### SUMMARY

At the outset it is extremely important to make, at least, a working diagnosis. In other words, find, if possible, into which class the case falls, whether the Nephroses, the Glomerulo Nephritides, or Arterio-Sclerosis, with its renal manifestations. If there is no difficulty in excreting waste products as indicated by a normal blood urea content, (20 to 40 Mgms. per 100 cc of blood), and the urea concentration of the urine is good (1,800 Mgms. per 100 cc), then the best results will be obtained by a liberal protein diet. In severe cases with retention, the use of Glucose and Insulin is to be recommended; especially Glucose because it is a food substance of high caloric value. It is free from waste eliminated by the kidney, and is the only food-stuff that can be administered in the raw, ready for use, immediately distributed and instantly utilized by the tissues of the body. (2) Insulin, because it is a hydrator; that is, it brings back to the protein particles of the blood their other constituents—electricity, salts, sugar, Amino Acids and fat. Consequently insulin is an antidote against any substance which causes or predisposes to inflammation, be it of bacterial or of chemical origin. In Glomerular Nephritis, Insulin makes the blood plasma more liquid and the vessel walls more elastic, producing vascular dilatation. In all renal conditions with high blood pressure, in uremia and acidosis, Insulin is the remedy of choice.

Diuretics seem to be of no value in acute Nephritis. Their success is confined to cases

of Nephrosis or of cardiac edema. The so-called "uremia" of acute Nephritis, sometimes accompanied by convulsions, appears to occur only when extensive edema is present and is probably dependent on a local edema of the brain, and is not usually of serious import.

Lumbar puncture should be done only after the onset of convulsions if at all. The complete suppression of urine cannot be materially influenced by any therapeutic measure.

The effectiveness of our therapeutic and prophylactic measures will be governed by our ability to classify each case according to the cause and the extent of damage suffered by the kidney.

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### DOES ANTI-RABIC SERUM PREVENT RABIES?

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Do sera and antitoxins prevent disease? That is, do we get a true immunity from the use of anti-toxin? It is commonly believed by the public that we do. The medical profession has openly stated that we do, the boards of health of various states not only say that it does prevent, but have persuaded the various legislatures to enact laws demanding the children be immunized against certain diseases, such as smallpox, diphtheria, and in some states scarlet fever and typhoid. Vaccines and sera are used in the United States Army and Navy; our soldiers and sailors have to take these sera, or vaccines because the medical authorities of the army and navy believe that they prevent certain diseases. It is generally understood and widely used in preventing the diseases that occur in the lower animals, both as preventives or curative agencies, such as cholera and rabies.

If the anti-rabic serum actually immunizes the animal against this dreaded infection, how are we to explain the action taken by one of the County Boards of Health Unit and published in the daily paper on the 11th of June, 1932? For instance a paragraph in which it states that it makes no difference whether the dog is immunized or not. "The health authorities issued a warning that after Sunday, 'any dog found running at large on the streets, alleys, public grounds, or highways within the city and county, whether licensed or unlicensed, vaccinated or unvaccinated, will be shot.'"



At first it may not seem that this step will amount to much. It has taken years to get the co-operation of this county in health matters, and it took no little trouble to persuade mothers to have their children immunized against diphtheria. In the Blue Ribbon campaign for three years, there were many women who visited mothers that objected to having their children immunized, and aided the Board of Health in this way to create confidence in the minds of the people to avail themselves of these opportunities to prevent some of these diseases of childhood. The mothers are now "shot wise," they are willing for their children to be vaccinated, or to take sera; in fact they send them to be immunized. But now, out of a clear sky, the County Board of Health Unit has announced to the community in just that many words, that the immunization of a dog is worthless.

Doubtless there will be some explanation given as to what was meant, and we think a great deal of explanation will be necessary. Someone has blundered, and unless blundering of this nature is prevented by the State Board of Health, we will find that the confidence of the public is going to be very much shaken and they will be more skeptical of the methods the medical profession is using in trying to prevent and combat epidemics; and this skepticism, we will have to admit, is just and well-founded. The individual who immunizes his dog against rabies to protect the public and also the animal is emphatically told that it makes no difference whether he has followed scientific advice and complied with the existing laws or not, his dog must be tied up until September 15th, or shot.

We believe in preventing disease. We believe in enforcing laws. We believe in having the citizen obey the law, especially health laws which affect the welfare of the citizen. But we also believe in justice, and if what we have taught the public is true, that these vaccines or sera are able to prevent and cure disease, the medical profession has no right to run rough-shod over the public and accredited scientific knowledge, and classify all animals under the same group. The most deplorable feature of this hasty utterance by the constituted authorities of this County Unit is, that it is going to have a direct effect and going to influence the public's mind very unfavorably, that is, shaking the confidence of the public in the value of anti-rabies serum, and every other method that is used to combat and prevent disease. It is the same thing as a teacher punishing a whole class because one pupil is unruly. The discipline that follows in that class, and the attitude of mind that is created in the pupil is far from amiable and it creates

a reactionary spirit due to the injustice to the majority of the class.

Annihilate the animal that has not been immunized, or keep him restricted. Why can't the animal have some definite mark placed on his collar designating that he has been immunized against rabies? Let the veterinarian give a statement at the time he immunizes the animal; let this be taken to the sheriff's office; let the sheriff affix this band, or metal, or whatnot, on the dog's collar, charging anywhere from 10c to 25c to defray the expenses and thus deal justly with the population.

There is no profession that must be more careful of dogma than the medical profession. Dogma has held back science for centuries. There is no profession that has been so persecuted for their effort to obtain knowledge as the medical profession, and there is no profession that has so nobly stood the vicissitudes and persecution of history as ours has. I do not say it boastfully, but the achievements of the medical profession have meant more to the human race as far as freeing it from superstition, dread, and disease, and making the world a better place in which to live than any other agency save Christianity. Many of the great inventions are for the purpose of helping man to live in a more healthy and sanitary condition so that indirectly much of what has been achieved has been the direct results, or stimulated by the medical profession, and it is very untimely and very unfortunate that the agencies of the medical profession should be the ones to start undermining the great principles upon which modern medicine has been built.

How far-reaching is the jurisdiction of the County Board of Health? This is a timely question. Might we put it in another form? How much authority has the Board of Health, and is it supposed to usurp the authority of the police and sheriff because they have failed to do their duty? In other words, is the County Board of Health an arm of the law, or is the law the arm that protects and insures the enforcement of rules and regulations that are for the welfare of the people? Why do we ask this question? Because, although strange as it may seem and incongruous, and out of place, it is nevertheless true, doubtless it was a hasty action taken with the probability a good deal of stimulation and encouragement from individuals who are not interested at all in the Board of Health or in public welfare in general, and I think undoubtedly without proper deliberation on the part of the County Health Unit, which has stepped out of an advisory capacity and has allowed itself to be used as an agency for enforcing law. This County Health Unit has placed itself in a very unfortunate posi-

tion. I hope that the State Board of Health will do its utmost to correct what is generally considered and admitted to be a blunder, and not to place it in a more unfavorable light, we will allow this terminology to designate this hasty action.

If anti-rabic serum is not potent, let us not continue to perpetuate this hoax on the public. If it is, let us not demoralize the public by taking such action as the one that we refer to in this article.

#### NON-PARASITIC HEPATIC ABSCESS- ES, WITH REPORT OF TWO CASES\*

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##### CLASSIFICATION

Abscesses of the liver may be considered under numerous classifications. For our purpose we shall divide them into two large groups. One of these is the parasitic type due to the amoeba coli. These abscesses embrace the majority of the cases but the actual percentage will vary with the climate where the comparisons are made. They are usually large and single, are found in one who lives or has lived in a hot climate, are usually accompanied or preceded by dysentery and, as a rule, are fairly amenable to surgical treatment. We shall not concern ourselves further with them in this paper.

The non-parasitic or pyogenic abscesses are usually considered to be small and multiple but are not necessarily so. They may be caused by any of the usual infective bacteria, staphylococcus, streptococcus, pneumococcus, Bacillus coli, Bacillus pyocyaneus, etc., and until rather recently the prognosis was generally considered universally fatal: e. g., Deaver in the 1921 edition of his "Surgery of the Upper Abdomen" states that, "Personally, we have never seen recovery in a case of multiple abscesses of the liver due to acute appendicitis." One reason for presenting this subject was to give the more encouraging side of the picture, as evidenced by recent articles, in spite of the fatal termination of the cases to be reported in this paper.

##### PATHWAYS FOR INFECTION

Due to the peculiar structure of the liver there are many avenues open for the passage of infection into its substance. These include penetrating wounds, arterial-borne infection, extension through the lymphatics, and contact soiling from contiguous abscesses such as are found in the subdiaphragmatic space resulting from peritonitis, a perforated gall-bladder

or pyloric ulcer, etc., all of which might affect other organs of the body. In addition, the liver is subject to infection through channels peculiar to it alone. These include retrograde embolic infection from the vena cava through the hepatic vein, ascending infection through the bile ducts and their tributaries, and, most important of all, infection arising in and carried by the portal system, usually from the appendiceal region.

Infection through most of these channels is comparatively rare and of little practical interest. The liver is rather well protected from trauma. Sub-diaphragmatic abscesses are more likely to be due to ruptured liver abscesses than they are to cause them. Arterial-borne infective emboli, the usual type of blood stream infection, affects the liver only as it does other organs of the body, the distribution of the abscesses usually being widespread. Of considerable academic interest is the rarest of all type of infection, i. e., retrograde embolic infection from the vena cava as described by Reininger. Here, it is believed that the infection carried by the blood in the vena cava is aspirated into the hepatic vein by the pulse of the wave of the right auricle. Ascending infection through the bile ducts is rarely reported, possibly because the natural adequate drainage system there renders them so mild that these abscesses are usually overlooked. As the liver apparently has normally no direct drainage from other intra-abdominal organs infection through the lymphatics probably begins in the retroperitoneal structures, continues through the parietal lymph vessels to the diaphragm and then gains entrance into the liver substance. The portal system is by far, the most frequently used pathway for the passage of infection to the liver. Infection of or by this channel is properly termed pyelephlebitis, a term which is not synonymous with all types of liver abscess. Pyelephlebitis may develop following the appearance of infection in any of the tissues drained by the portal system. It may arise in cases where no operation is contemplated or apparently indicated or in operative cases before, immediately after, or many days after the operative procedures are done. In the latter instances after recovery seems apparent, it is most difficult to explain the complication to the patient's friends.

##### OCCURRENCE

The primary focus most frequently responsible for the development of pyogenic abscesses of the liver is, of course, acute appendicitis. Statistics vary but it seems likely that perhaps 2% of all cases of acute appendicitis are followed by liver abscesses. Some series of typhoid fever cases have shown



an even higher incidence while others have shown none at all. Rarely cases have been reported as complicating suppurative diverticulitis and they might possibly follow infected or thrombotic hemorrhoids. Further, liver abscesses probably occur more frequently with an acute suppurative cholangitis than is usually considered—the course of the disease here being rather confusing because of the possibilities for drainage previously mentioned.

#### PATHOLOGY

Due to its greater size and its more ready access to the portal stream, the right lobe of the liver is more frequently affected. The left lobe is, however, by no means immune to the development of these abscesses. It has been suggested that those in the left lobe may be due to infective emboli arising in the omental veins and being transported to the portal vein by the gastric branch.

While it is true that most pyogenic abscesses of the liver are multiple and small, single abscesses or several fairly large ones, resulting from the fusion of several smaller ones, may occur. In size, the abscesses may vary from the most minute to those containing many ounces of pus. The degree of inflammatory reaction may be comparatively slight or nearly extensive enough to suggest acute yellow atrophy. Frequently several operations may be necessary to drain the various cavities but after recovery has apparently occurred, recurrence is quite rare—one of the few cases reported being that presented before this society by Elmore and Abell in 1928.

When infection passes through the portal vessels the infective embolus may occasionally float away from the region of the appendix, for example, and leave no evidence along its path. Generally, though there will be a demonstrable evidence of thrombosis in those vessels. It is believed by some that this thrombosis is responsible for blocking the passage of many possible septic emboli, since it usually precedes the inflammation in any particular segment of vein. Another factor in explaining the fact that there are relatively few pyogenic abscesses of the liver in spite of the frequent infections accessible through one or more of the many available channels must be a definite bacteriolytic action exerted by the liver cells. In this view, Eliason quotes Heyd as stating that, "Bacteria carried to the liver do not always undergo proliferation, but are destroyed in the liver tissue, resulting in a chromatolysis and vacuolization of the liver cells with the formation of free pigment. Coincidentally there is an invasion of round cells with the ultimate result of a small area of necrosis later re-

placed by fibrous tissue." This immunity seems to apply particularly to *B. Coli* which fortunately is probably the one most frequently carried by the portal route.

Where the retroperitoneal tissues are involved an actual pus collection is rare, although oedema of the structures is a frequent finding.

The liver is more likely to show a definite enlargement in those cases where the abscess is large and single than where there are multiple small abscesses. In the latter instance, unless some of the abscesses are near the capsule, the liver may grossly appear quite normal. If the abscess or abscesses be near the surface there may be some softening palpable, but often there is none. Abscesses near the surface may rupture resulting in a subphrenic abscess.

#### SYMPTOMS AND PHYSICAL SIGNS

The symptoms and physical signs of pyogenic abscesses of the liver are those which might be expected but are not characteristic enough to make a diagnosis unless one bears its possibility in mind. During the course of the primary infection or after convalescence has apparently begun with the return of the temperature to normal, an irregular fever will develop. After a few days, pain or more commonly tenderness or possibly both in the region of the liver or in the epigastrium will be noted. Occasionally the pain will be referred to the right shoulder if the abscess be superficial and in contact with the diaphragm. This pain or tenderness will be followed by lassitude or toxic depression all out of proportion to the other symptoms at first. Anorexia and rapid emaciation will result from the toxemia and pain. While vomiting is not so common, nausea will be frequent but not constant. The appearance of a hard chill or noticeable chilly sensation followed by a temperature rise are common and significant. Gerster states, "Chills accompanied by rapid rise of temperature observed during the course of an appendicitis, however mild as to the local symptoms, may and usually do signify entrance of septic material into the portal and general circulation." These chills may appear before, immediately after, or some time after any operative procedure is done. The probability of the appendix being gangrenous if chills precede the operation is a finding many of us have observed. Another symptom of the disease is sweating which is apt to be profuse and weakening. Jaundice of some degree will usually appear during the course of the illness and is frequently deep and rather constant.

Enlargement of the liver is variable depending upon the number, size, position, etc., of the abscesses. Restriction of respiratory

motion and elevation of the diaphragm are generally more pronounced than the palpable enlargement or downward displacement of the liver. The signs of pneumonia in the base of the right lung, which are sometimes present, may be due to compression rather than infection of lung tissue. Ascites and pleural exudate are late findings if present. The local superficial veins may become prominent. Eliason has called attention to a local oedema of the skin overlying the hepatic region. While it was a rather constant finding in his series it was not present in my cases and others have reported their inability to elicit it.

#### LABORATORY FINDINGS

The urinary findings are not characteristic. A toxic albuminuria may result, and of course if jaundice be present, bile or even urobilin may be found. The appearance of indican or the acetone bodies will depend upon the patient's general condition.

The red count and hemoglobin determination will depend upon the degree of anemia. The white count will always show some elevation and may be quite high. A malaria hunt is indicated in the presence of the chills but will be negative in the absence of malaria. Positive blood cultures are obtained only in those cases where there is a general septicemia. Icterus index determinations are valuable not only because they give a quantitative estimate of the varying degrees of jaundice but also because they will show the presence of a latent jaundice or subicteroid tinge.

X-ray findings may be quite important—not so much in diagnosing the presence of liver abscesses directly as in eliminating empyema, subphrenic abscesses and other conditions whose possibilities might offer confusion.

Various hepatic function tests may be done. Their results, however, will be indicative of the degree or type rather than the cause of the impairment of function.

#### DIAGNOSIS

Due to the lack of characteristic symptoms and the frequent paucity of physical signs the diagnosis is usually arrived at after eliminating other possible foci and keeping in mind the possibility of liver abscesses as one considers the etiological factors which may be present. Cabot states that, "In the region of the liver is usually the source of chills for which no obvious cause can be found. When we have searched the blood, sputa, subcutaneous tissues, ears, throat, and heart for septic foci and found none it usually turns out that the source of infection lies in septic thrombosis of the portal vein, hepatic abscess single or multiple, or in subphrenic ab-

scess." We feel, of course, that the kidney should be added to list of foci just mentioned.

A thorough history and physical examination including rectal and vaginal palpation (to rule out pelvic abscess) and an inspection of the recent incision if one is present, together with a study of the urine with especial reference to the presence of pus and of the blood with especial reference to bacteria or malarial organisms, should enable us to locate the cause of the fever and chills (or chilly sensations) in the region of the liver. A suppurative cholangitis usually presents a history of calculus disease and more evidence of biliary obstruction. Right subphrenic abscesses will usually give some history of antecedent gastro intestinal disease. The diaphragm is usually elevated and the liver pushed downwards. Often a fluid level and the presence of gas can be demonstrated in these cases by x-ray examination. There is likely to be some fixation of the diaphragm and but little tendency to jaundice or other signs of liver injury. Even when a subphrenic abscess is demonstrated satisfactorily one must bear in mind the possibility of a caustive or co-existing liver abscess. The elimination of these local and other remote foci of pus would then lead us to a probable diagnosis of liver abscess. Only in unusual circumstances, such as the presence of a positive blood culture, could we hazard an opinion as to whether the abscess were single or multiple.

While considering the subject of diagnosis we must remember that promptness is second only to accuracy. Correct diagnosis and proper treatment will be ineffectual if unnecessary delay has allowed the patient to become too poor a surgical risk.

#### COURSE AND PROGNOSIS

Undoubtedly there must be many cases where small abscesses develop in the liver and are taken care of by the bacteriolytic action of the liver cells. Possibly many due to a suppurative cholangitis are controlled by drainage through the biliary tract with which they communicate. Some abscesses have been demonstrated to have drained into a portion of the gastro-intestinal tract and others to have ruptured through the diaphragm into the pleural cavity or through the lung tissue into a portion of the bronchial tract. Still others rupture into the abdominal cavity becoming subphrenic abscesses. Those communicating with the gastro-intestinal tract are the most likely to heal spontaneously since dependent drainage is established.

The possibilities just mentioned are unusual courses to be followed for when the disease advances far enough for the patient to become quite ill death is the usual termina-



tion to be expected unless drainage can be and is instituted. The emaciation is so marked and the hepatic toxemia so depressing that the decline is rather remarkable.

On the other hand if adequate drainage be established, and repeated if necessary, before the patient is too exhausted, recovery may be expected in nearly 50% of the cases—thus leaving little argument in favor of nonsurgical treatment.

#### TREATMENT

About the only practical prophylactic measure that can be instituted is further advocacy of early operation for acute appendicitis. Since appendicitis, or rather neglected appendicitis, is by far the most frequent cause of pyogenic abscesses of the liver the removal of appendices before septic thrombosis or embolism occurs in the portal vessels will prevent the development of most of these abscesses. Once their presence is established or considered reasonably likely exploration would seem to be the only logical treatment. Cases showing multiple small abscesses will not be helped (nor hurt, either) but since a differentiation between those and the cases showing larger collections of pus amenable to drainage is generally impossible before exploration that procedure seems indicated in all cases.

Aspiration which has been especially successful in the large amoebic abscesses has its advocates in the type of lesion under consideration. It is a rather "blind" procedure with such possibilities for harm that it would seem to be but rarely indicated, and then only when the surgeon is prepared to proceed immediately with a laparotomy should pus be found.

A transpleural or subpleural approach or the transperitoneal route offer much more satisfactory exposure. In the former the 9th or 10th rib is resected in the midaxillary line and the pleura, if encountered, is packed or sutured before the diaphragm is incised or aspirated.

Since the location of the abscess in the liver is frequently even more doubtful than is the diagnosis of the presence of an abscessed condition of the liver the abdominal approach, seems to offer the best opportunities for exploration not only of the entire abdominal cavity but also of the various portions of the liver. When pus is located by palpation or aspiration of the exposed liver adequate openings should be made and drainage established after protecting the surrounding field for contamination. General supportive treatment transfusions, intravenous medication and food, and reoperation where indicated should be the further course of treatment.

#### CASE REPORTS

Within a period of two years it was my unfortunate experience to have two proved cases of pyogenic abscesses of the liver which I shall now report briefly.

Case 1. Miss D. G., 48, was seen on February 2, 1930 complaining of abdominal pain. Her family history was negative and her previous personal history until 1927 was unimportant. Early in that year she was badly bruised and suffered several minor fractures in an automobile accident. During her convalescence she developed a rather severe phlebitis of the left leg and thigh. Her recovery was slow but rather complete and she had been quite active since. Later in 1927 she had had a hemorrhoidectomy done and her post-operative course was uneventful.

In July 1929 she was seen at the conclusion of what had apparently been a light attack of appendicitis. During the following six months she had two other gastro-intestinal upsets which however were suggestive of neither gall-bladder nor appendiceal disease. She complained of slight sour stomach at times but ate heartily. She had recently noticed that she tired easily. (Later, at about the time of her death, we learned that shortly before the onset of her last illness she sustained a bruise on her left leg. Subsequent findings indicated that this injury may have had a causative relationship.)

Several days previous to appearance of the abdominal pain she had been unusually indiscreet in her diet and had become quite weak and faint while in town shopping. The pain which followed the attack of weakness was quite severe and was accompanied by the passage of several stools in 24 hours. No purge was given for 3 days because of the history of possible appendicitis. When it was given she improved considerably and was able to get up. Her tongue became moist and there was little abdominal pain except in the epigastrium. She began to run a fever and have chilly sensations and pain in her back. Her urine examination was then negative except for one plus albumin. She became progressively worse, fever, and chilly sensations recurred and she was decidedly drowsy. Ten days after the onset of her illness another urine specimen was examined and it showed not only albumin but also bile and indican—there was however, no pus present. Widal test and Malarial hunt negative. White count at that time was 16,000 with 84% polymorphonuclears. Enemas were given with excellent results and the temperature was normal for 48 hours, but she developed a terrific nausea. The pain had left the abdomen and was present only in the back at the level of the liver. The lungs remained clear and the

heart normal except for an acceleration of rate. There was no localized tenderness in the abdomen. A diagnosis of hepatic toxemia of undetermined origin was made. On the morning of Feb. 15, 1930, two weeks after the onset of her illness a deep jaundice appeared and a diagnosis of probably multiple abscesses of the liver was made. She was sent to the hospital where she remained until her death two weeks later. While in the hospital she was seen in consultation by Drs. Lucas, Abell and Dowden.

There was no improvement at any time. During those 14 days she had six hard chills lasting about 25 minutes each. There was practically always some moderate abdominal distention. The patient did not complain of pain or tenderness but this was possibly due to the fact that she was so toxic and drowsy at the time. On Feb. 18, a palpable mass was first noted under the right costal arch. While an enlarged gall-bladder was considered as a possibility the consensus of opinion was that the mass was the enlarged liver. Three complete urine examinations each showed only albumin, bile and increasing numbers of pus cells. On Feb. 19, Urobilin was present in the urine. Feces examination on Feb. 23 showed muens and a faint trace of bile but no blood, parasites or ova. A blood culture taken on Feb. 22 when she had a hard chill was negative for growth at 24, 48 and 72 hours. Icterus index readings were 150 on admission, then subsequently 50, 50, 75, 50 and 44. Five blood counts showed a range of the white blood cells from 15,300 to 27,500 with a polymorphonuclear percentage of 89.5 to 96. Her temperature was very irregular generally reaching 102 or 103 sometime during each 24 hour period. Just before her death it went to 106. Her pulse stayed around 120 and her respiration 25 to 30.

Immediately after death an autopsy was performed by Dr. Webster, who gave the following report.

Gross: The body is that of a large adult female showing marked generalized icterus.

Autopsy limited to abdomen only.

Liver: Shows enlargement, fatty degeneration and multiple abscesses.

Gall-bladder: Enlarged and sclerosed and free of stones.

Pancreas shows marked pancreatitis with abscess in the tissue beneath the head.

Retroperitoneal lymph nodes enlarged. There is an abscess yielding large amount of yellowish green fluid at the root of the mesentery; pus beneath and above the spleen. There are adhesions and thickening of vessels in the left iliac region, apparently the result of former phlebitis and periphlebitis from which present infection arose.

Kidneys show no abscessed vessels, the same are negative.

Uterus is normal in size and free of adhesions.

Tubes are negative in appearance; there is no evidence of present or past tubal infection.

Ovaries show simple cysts only.

#### MICROSCOPIC DESCRIPTION

Liver shows focal abscesses and a diffuse reaction chiefly lymphocytes, especially in abundance around the portal triads.

Pancreas shows a marked interstitial reaction of lymphocytes and neutrophils mixed and some increase in fibrous tissue.

#### Anatomical Diagnosis

Multiple abscess of liver, abscess of mesentery glands and retroperitoneal tissue.

Subacute Pancreatitis.

#### FINAL DIAGNOSIS

Multiple abscesses of liver, retroperitoneal tissue and mesenteric lymph nodes with areas of localized peritonitis. Subacute Pancreatitis.

It seemed therefore that the primary focus in this case was in the left iliac region at the site of the old phlebitis and periphlebitis and that the infection ascended retroperitoneally with the production of the abscesses as described. Infection of the liver probably occurred through the lymphatic channels. Our decision that this was not an operable case was verified by the post-mortem findings. As a general rule, however, I believe that exploration is the procedure of choice since it is likely that the findings of this unusual case will be seldom encountered.

Case 2. Miss L. F., 17, was first seen in consultation on July 27, 1931. Her family history was entirely negative. She had had no previous operations or serious illnesses. However, she had been underweight and extremely nervous. Medical treatment for the latter condition had been discouraging and during the several weeks before I saw her she had been taking a course of chiropractic adjustments. The illness for which I was called was of 3 days duration. It had begun with abdominal cramps, followed by nausea, vomiting, fever, and soreness in the right lower quadrant. Cathartics and chiropractic treatments for this additional intestinal complaint had given no relief and she was in great pain when first seen. Her temperature was 98, pulse 80, and respiration 20. There was decided tenderness over McBurney's point. Her blood count showed 4,820,000 R. B. C., Hemoglobin 90%, and only 8,400 W. B. C., but a differential count of 99% polymorphonuclear cells and a marked left shift according to a Schilling count. A diagnosis of acute appendicitis was made and immediate opera-



tion advised and accepted. The appendix was found to be gangrenous throughout its extent and to be firmly adherent in the retrocecal position. Probably because of this position the general peritoneal cavity was uninvolved. By incising the peritoneum lateral to the cecum the appendix was rather easily mobilized and excised, its stump carbolized and inverted, and the abdomen closed after instituting drainage. Her post-operation course was never entirely satisfactory. While she relished and retained her food she had considerable abdominal pain, complained of weakness, nervousness and restlessness. The drainage, profuse at first, gradually lessened; but she continued to have some fever every day. She was discharged from the hospital on August 9, her thirteenth day, because she was anxious to go home, not because she was well.

After her return home her temperature varied from  $99\frac{1}{2}$  to 101 and pulse from 110 to 130 for about a week. During that time the abdominal wound healed nicely. On the morning of August 17, she had a hard chill followed by temperature of  $103\frac{1}{2}$  and pulse 130. While there was no mass palpable, vaginal and rectal examination did show slight thickening in both broad ligaments. That evening she passed some greenish pus from the rectum and vagina and the temperature dropped to 100 and pulse to 110.

Her general condition, however, did not improve, the temperature ranging from 99 to 101 and pulse from 100 to 110, weakness and loss of appetite continued, and she complained very much of epigastric pain and tenderness. No abdominal distention. Urine normal. While there were no more definite chills, she did have occasional chilly sensations and on August 27 after a more marked one her temperature went to 103 and pulse to 128. For the next 12 or 14 days until her readmission to the hospital she showed a temperature of 101 to 103, a pulse of 110 to 135 and a continuation of the general symptoms first mentioned.

She was readmitted to hospital on September 9, at which time her complaints were severe pains in epigastrium, extreme nausea, marked loss of weight, jaundice, chills and fever, and abdominal distention. Her blood count showed 3,112,000 R. B. C., Hemoglobin 20% and W. B. C. 11,000 with 80% Polymorphonuclears. The clotting time was 4 minutes and her blood matched with 3 prospective donors. The urine was negative except for a trace of albumin. On the following day an x-ray of the chest and abdomen (flat plate) showed the lungs and costophrenic angles to be clear and there was no elevation of the diaphragm and no fluid level in the subphrenic space. A transfusion of

500 cc of citrated blood on the next day was immediately followed by a deep cyanosis which cleared up after the administration of oxygen. Her appetite was variable. Sometime she relished and retained her food and at other times vomitted almost immediately after eating or drinking. The pain in the epigastrium and lower part of the chest was rather constant. Her bowels moved regularly generally without an enema and were usually dark brown in color. Her temperature ranged from 100 to 103 and pulse from 130 to 140. On Sept. 13 she became quite jaundiced and intravenous administration of glucose and subcutaneous administration of saline were begun. Two days later the jaundice practically disappeared but some pedal oedema developed and the superficial abdominal veins became more prominent. On the following day there was a definite ascites. The patient's condition was becoming progressively worse and although the diagnosis of a suppurative pylephlebitis was made an exploration was done under local infiltration anesthesia in the hope that an abscess cavity might be found. Examination of the peritoneal cavity disclosed much ascitic fluid but no evidence of peritonitis and no gross adhesions. The coils of intestines were collapsed and there was no abscess in the subphrenic area or the lesser peritoneal cavity. The retroperitoneal tissues were not edematous and no thrombi were palpated in the portal or mesenteric veins. The liver showed only slight markings of hepatitis but was much enlarged and tender. Aspiration of the right lobe gave a thick yellow pus with a foul odor, (this was subsequently examined and the presence of a small unidentified bacillus was reported, I believe it was *B. Coli*). The peritoneal cavity was closed up to the liver and the edges of peritoneum were sutured to the liver leaving exposed the area which had been aspirated. A pair of blunt forceps were passed along the aspirating needle down to the abscess cavity releasing a large amount of pus. Palpation of the cavity showed no pockets or extension. There was practically no bleeding. A fenestrated soft rubber tube was inserted for drainage. Following the operation there was a great relief of the epigastric pain and food was relished and retained much better although there was still occasional vomiting. During the remaining 13 days there was profuse drainage from the abscess cavity. While there was some distention and low abdominal pain after the operation it seemed to be more like a mild paralytic ileus than a peritonitis. A week after the abscess was drained the patient was able to be put in a wheel chair but gradually became weaker and died on the 13th day. An autopsy was not secured but

I am inclined to believe there were other abscesses in the liver which might have been located and drained had the patient's general condition permitted it.

In this case it seemed likely that the liver had been infected through the portal route. In the absence of palpable thrombosis of the portal vessels the abscess was probably caused by a septic embolus which was dislodged before or soon after the first operation and then floated up into the liver. In fact, it has been claimed that when a single abscess or a small number of abscesses form, septic emboli, rather than extensive thrombophlebitis, are usually responsible.

#### SUMMARY

1. Two proved cases of non-parasitic abscesses of the liver have been presented. One of the proved cases was the result of a retroperitoneal infection following a phlebitis and periphlebitis of the left iliac vessels. The diagnosis of multiple abscesses of the liver was confirmed by autopsy which showed further that operation would have been ineffectual. It had not been done since the jaundice was so deep and the toxemia so profound that the patient appeared fatally ill. The other proved case was due to a pyelephlebitis following a gangrenous appendicitis. Its symptoms were somewhat similar to the first. A large abscess of the right lobe was satisfactorily drained. The fatal termination may have been due directly to delay in operation in that the patient was too weak to recover or indirectly in that exploration for other abscesses could not be carried out.

2. While pyogenic abscesses of the liver are fortunately rare they must be borne in mind as a possible complication especially in those cases of appendicitis where the convalescence is not as usually expected.

3. These abscesses are not necessarily multiple and even when they are some of them may unite to form one or more of considerable size and amenable to drainage.

4. Practically all cases treated non-surgically terminate fatally whereas recent reports show a mortality of only slightly over 50% in cases operated or reoperated.

5. Since it is quite difficult to distinguish between single and multiple pyogenic abscesses of the liver exploration would seem to be the safe procedure in those cases showing chill, jaundice, emaciation, lassitude, and epigastric pain which cannot be otherwise satisfactorily explained.

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#### DISCUSSION

**M. J. Henry, Louisville:** I think a paper such as Dr. Hancock has presented leaves very little for any discussor to say, he has covered the subject so thoroughly. He has emphasized the type of abscess which is not due to any protozoan, or to extension from the gall bladder. Tropical abscesses of the liver are unilocular and most of the abscesses of this form are supposed to be amoebic type. Amoebiasis for a long time was thought to be a tropical disease but investigative work carried on for the past decade or so has shown this to be very prevalent in this country and consequently one should be on the lookout for more cases of amoebic abscess of the liver. The mere fact that the amoeba cannot be recovered from the discharge from these abscesses does not render the diagnosis of amoebic abscess impossible; for one investigator has reported approximately 200 cases, in only eleven of which was he able to recover the protozoan. Personally, I have not encountered a case of multiple small abscesses of the liver due to infection through the portal system. I have seen one case of pneumonococci abscess of the liver following the so-called flu, in which there was a pleural effusion. Dr. Hancock mentioned a case reported by Doctors Elmore and Abell, in which at an interval of two years two operations for abscess of the liver were performed. Twice since the last operation this patient has been observed because of symptoms resembling those he had previously experienced. Each of these attacks yielded to the intravenous injection of 1% aqueous solution of gentian violet. This man so prefers this treatment to operation that I am sure any surgeon would have difficulty in operating upon him should there develop another abscess. The difficulty in diagnosing the condition of multiple liver abscess is easily understood, when one considers the similarity of its symptoms to those of sub-diaphragmatic abscess. I doubt if one can ever make a positive differential diagnosis, though the presence of this condition might be often suspected. Since the treatment of both is surgical and that both require a similar approach, it would seem that a differential diagnosis is of secondary importance. In my hurried search through Dr. Abell's records, I was able to find six cases of liver abscess of the type described by Dr. Hancock; two of these cases having two operations. All of these patients recovered following drainage of the abscess.



**Malcolm Thompson**, Louisville: Both the society and Dr. Hancock are to be congratulated upon the comprehensive nature of this paper. It not only covers the subject fully, but it gives in details his own experiences, which is undoubtedly the best method of teaching.

It only remains for me to emphasize some of the points to which Dr. Hancock called attention. The most important factor concerning a serious disease such as this is prevention. The commonest cause of non-parasitic hepatic abscess is appendicitis. At the present time we cannot prevent appendicitis, but we can sometimes avoid its complications such as this. That is by immediate appendectomy as soon as the diagnosis is made. Cases that are frankly chronic can of course wait. It is usually advisable to wait in cases with generalized peritonitis until the condition is localized, but in all other cases of appendicitis there is but one course to follow and that is immediate removal of the appendix. The public is largely to blame for most delays in treating appendicitis, but sometimes we physicians are at fault. A delay of even an hour or more may be just the time sufficient for a small embolus to enter the ileo-colic vein, and thereby enter the portal vein through the superior mesenteric and finally reach the liver. The delay of a few hours not only permits the liberation of septic material, but it weakens the patient's resistance to infection. A case of acute appendicitis seen at 6 a. m. should be operated upon at that time, and one should not wait until his regular operating hour at say eight or nine o'clock.

Next to prevention diagnosis is of importance. As Dr. Hancock has said it must be mainly by exclusion and by always bearing in mind the possibilities of this condition. Urine should be constantly searched for urobilin because if there is no urobilin in the urine, it is most unlikely that abscess of the liver is present. This is a very reassuring thing to know. Abscess of the liver practically always causes urobilinuria unless there is in addition complete obstruction of the common duct. Another important factor in diagnosis is that very few of these cases give a positive culture of the blood. This is also true of pyelophlebitis when the portal vein is full of septic clot. This is due to the liver being an efficient filter and seldom do organisms get beyond it. In suspected cases, aspirat on posteriorly should always be tried. No harm can be done if one is careful to avoid the pleural reflection and if pus should be found by this method posterior drainage of a single abscess offers much greater chances to the patient than anterior drainage. If pus is not found posteriorly, then of course, anterior exposure of the liver must be performed. When this is done if an abscess or abscesses sufficient to explain the symptoms can not be discovered, the veins leading to the liver from the septic focus should be

examined for clots. If clots are found they must be evacuated and if in one of the smaller veins ligation done in addition to evacuation.

**B. F. Zimmerman**, Louisville: Dr. Hancock mentioned one cause of abscess of the liver that is very interesting; viz., that produced by retrograde embolism. When it occurs, it is usually as a complication of sinus thrombosis, meningitis or abscess of the brain. The septic embolus is carried through the superior cava to the auricle, and from there into the inferior cava against the blood stream and finally enters the hepatic vein where it blocks some of the tributaries, and from this septic embolus the abscess arises.

It is sometimes better to approach the abscess by the transpleural route. The parietal pleura may be sutured to the diaphragm, thus protecting the pleural cavity or as the diaphragm is carried high a pack of iodoform gauze may be placed against the parietal pleura, after rib resection, with sufficient pressure to cause it to adhere to the diaphragm. In 24-48 hours the pleural cavity will be completely protected by adhesions and the abscess may be opened through the diaphragm. This method is especially valuable in those cases where the abscess is high in the right lobe.

Multiple abscesses are usually not amenable to treatment by operative measures.

**J. Garland Sherrill**, Louisville: This is an interesting topic and has been exceedingly well presented in a very practical way by Dr. Hancock.

I am not going into the site of the original infection, but maintain that almost any portion of the alimentary canal from the stomach to the anus can be the site of an initial lesion of the phlebitis which causes the trouble.

As mentioned by Dr. Zimmerman, the history in these cases is exceedingly important. If you get a clear-cut history of a primary lesion with subsequent elevation of temperature, chills and sweats, every day for some little time, with jaundice, gradually increasing, you can certainly expect an abscess of the liver from thrombo-phlebitis. The case Dr. Zimmerman mentioned was a concrete example of the development of this type of hepatic abscess. An attack of appendicitis, perhaps a localized small abscess and infection with thrombosis of the mesenteric vein and a pyelophlebitis is the usual course in the development of abscess of the liver. Marked suppurative thrombo-phlebitis of the portal vein with abscess of the liver, completes the picture. As Dr. Thompson has stated, the cure of this condition lies in its prevention. I shall go a step farther and say that after you make a diagnosis of appendicitis, prompt operative removal, with double ligation of the veins, will prevent thrombo-phlebitis.

The diagnosis of liver abscess may be facilitated by x-ray studies. It is sometimes dif-

ficult but not important to differentiate between a sub-diaphragmatic abscess and abscess of the liver. The main thing is to drain all abscesses; the anterior approach will be most satisfactory.

This paper is very meritorious and brings out the recognition of the possibilities of the development of hepatic abscess from lesions of the spleen, appendix, and intestines. It would pay every one of you to read an article published in the *Annals of Surgery* in 1905 by Dr. John C. Munro, entitled "Lymphatics and Hepatic Infections Secondary to Appendicitis." The references are Vol. 42, p. 692 to 734.

**Harry M. Weeter, Louisville:** In regard to unilocular abscess of the liver in which the laboratory findings are often negative, I wish to state that this is due to the type of material submitted for examination. The pus taken from an abscess usually contains no amoebae, these having undergone digestion. To obtain a positive laboratory finding, the surgeon must curette, or scrape the wall of the abscess in order to secure viable tissue since the amoebae live only where there is healthy tissue to supply food.

In Dr. Hancock's one case upon which I performed an autopsy, the common foci of infection resulting in liver abscess, namely, the appendix, gall-bladder and pelvic organs all were negative. The only positive finding was a thrombo-phlebitis on the left side and leading from this a chain of infected retroperitoneal lymph nodes. Our conclusion is that this thrombo-phlebitis was the source of infection of the liver abscess.

**Raymond M. Evans, Louisville:** Dr. Hancock has certainly presented a wonderful paper. He is to be congratulated on his splendid and extensive work on this subject. I have thoroughly enjoyed it as well as the detailed discussions which it has brought forth.

As we all know, it is difficult in these cases to arrive at a diagnosis. Sometimes we have an abscess that is trying to burrow backward, as Dr. Sherrill has pointed out, and it will be, perhaps as we had one recently of the right lobe of the liver in a boy 18 years of age, located posteriorly and just anterior to the lower pole of the right kidney. To differentiate between this and a perinephritic abscess was no mean task. Pyelograms had shown a fuzzy appearance of the lower calyces of the kidney and with clinical history and signs of a deep seated abscess, confirmed by laboratory tests, together with pain on hammer percussion over the kidney, we explored the kidney fossa and found nothing. However, there was definite induration around the lower pole of the kidney. Later we approached from the front through a right rectus incision and found a large solitary abscess in the posterior part of the right lobe of the liver. A large calibered needle, with a 20 cc syringe was inserted into the tensely swollen mass and thick creamy pus was aspirated. The

abscess was then opened with a curved forceps and about 200 cc of thick creamy pus was evacuated. We made a counter opening in the right flank just opposite and adjacent to the abscess and inserted and sutured a large fenestrated tube, and another tube and a cigarette drain were placed in the liver notch and brought out through the rectus incision. This patient made an uneventful recovery. The abscess was unusual in that it seemed to be of metastatic origin. Cultures showed a pure growth of staphylococcus aureus. There had been no history of appendicitis nor any abdominal operation. The illness began two or three weeks following a clean tonsillectomy by one of the Ear, Nose and Throat men in this city, with general malaise, pain in the right kidney region, with fever and chills extending over a period of some three or four months, until the abscess was finally drained.

I wish to mention another point to which Dr. Sherrill referred in the differential diagnosis of subphrenic abscess: namely, the air pocket found upon x-ray examination. It is present only when you have a perforated viscus, such as from a ruptured appendix or perforated ulcer of the duodenum or stomach, or rarely in a metastatic abscess when the offending microbe is anerobic and a gas-producing germ. The ordinary metastatic abscess will seldom show in the x-ray, however, as I pointed out in my paper on subphrenic abscess read before this Society several years ago, about fifty per cent of them originate from a perforated viscus. This fact was confirmed by a combined report of several hundred cases in the literature including series of cases of Perutz, Maydl, Korte, Barnard, and Piquand.

I wish also to stress the important information given us by Dr. Thompson in reference to urobilin. This is a point well taken. Urobilin tests are a great aid to us in differential diagnosis of hepatic and other upper abdominal conditions. A urobilin test is a good index to liver function but it is not a factor in obstructive jaundice. Patients with liver dysfunction may have a sallow appearance of the skin and a distinct icteroid tinge of the sclerae with urine the color of light black coffee due to large quantities of urobilin; and yet these patients are not jaundiced and the urine will not show any bile pigments, namely, bilirubin and biliverdin. A few weeks ago a post mortem examination revealed the cause of such a clinical picture in a patient who had a carcinoma of the tail of the pancreas with extensive metastases to the left lobe of the liver.

Urobilin pigment is present in traces normally but too small to detect by ordinary tests. It is now regarded as identical with hydrobilirubin, the principal coloring matter of the feces. It is excreted as a chromogen, urobilinogen, which is changed into urobilin through the action of light within a short time after the urine is



voided. A great excess gives the urine a dark brown color suggesting the presence of bile, but does not color the foam as does bile, and other tests for bile are negative.

The mode of formation of urobilin is not clearly understood. According to the generally accepted view it is a decomposition product of bilirubin, formed chiefly in the intestine through the action of bacteria. Urobilinogen is first formed. Under normal conditions a portion of this is absorbed from the intestine, carried to the liver in the portal blood, and there reconverted into bilirubin. When the liver cells are deranged, this transformation into bilirubin does not take place and urobilinogen reaches the general circulation and is excreted by the kidneys. The remainder in the intestine, changed largely into urobilin, passes out with the feces. The pigment and the chromogen have exactly the same significance in the urine, and the name "urobilin" is commonly used to cover both.

Urobilinuria usually points toward functional incapacity of the liver. There is one exception whenever, owing to excessive destruction of red blood corpuscles, there is excessive formation of bilirubin, and hence an increase of urobilin in the feces, and also a marked increase in the urine.

Clinically one should say that urobilinuria is indicative either of hemolysis or liver damage, one or both, from various causes. And one should remember that urobilin in the urine is nearly or entirely absent in obstructive jaundice. A simple test is available for its recognition.

Another promising functional test of the liver has been offered recently by Shay and Schloss of Philadelphia in the differential diagnosis of icterus by the galactose tolerance test. Forty grams of galactose in 500 cc of water is given by mouth and the urine collected for 5 hours. Estimation of the amount of sugar present is determined according to the Benedict quantitative method. The normal range of excretion for 5 hours is from 0 up to 3 grams, but if the quantity rises above this level it is indicative of damage to the liver cells through a toxic or infectious process. Accordingly in an obstructive jaundice where there is no damage to the liver cells the level will be below the 3 grams. While they do not claim it determines any specific etiology they think it is the only positive means of identifying toxic or infectious jaundice early in its course.

I desire to thank Dr. Hancock again for his very informative paper and the fellow members of the Society for their part in the interesting discussions.

**Guy Aud, Louisville:** I wish to express my appreciation to Dr. Hancock for the splendid presentation he has given. I am sure that the members of this Society feel very much indebted to him.

I have had but two cases of single abscess of

the liver and, fortunately, both recovered. One was in a boy of eighteen years of age with a large abscess of the right lobe of the liver which had perforated posteriorly. The origin was probably from a severe contusion of the back which he had sustained about two weeks previous to the development of the abscess of the liver. Cultures made from the abscess showed pure culture of staphylococcus aureus. Drainage was established through an anterior abdominal incision. This was not effective owing to the thickness of the pus and, later, a posterior approach to the abscess was made by going through the chest cavity by means of a two stage operation. In this manner through and through drainage was established. After a very "stormy" convalescence this patient made a complete recovery.

The second case followed an acute attack of appendicitis which subsided for a few days and then became worse. On admission to the hospital the patient, a boy of four years of age, had an appendiceal abscess. The right lobe of the liver was down to the creast of the ilium. After removal of the appendix and drainage of the appendiceal abscess and the abscess of the liver he made a very satisfactory recovery.

Abscess of the liver is, usually, difficult to diagnose. The x-ray is of some help in making a diagnosis but the findings are not always conclusive. Aspiration frequently enables us to locate the abscess in the liver. It should always be done on the operating table and when pus is located the needle should be left in place and used as a guide to the abscess cavity. This may be done best with the actual cautery.

#### Conservative Therapy of Ureteral Fistulas.—

Ottow, after pointing out that the majority of ureteral fistulas result from gynecologic or obstetric interventions, emphasizes the great significance of the differentiation between total and partial defects of the ureteral wall. It should be determined whether the continuity of the tube is entirely interrupted or whether there is only an opening in the wall. This is possible with the aid of cystoscopy. The differential diagnosis is significant especially for the treatment, because in cases in which there is only an opening in the wall one can treat the patients in a conservative manner, namely, by introducing a permanent catheter. Because of its simplicity, the author recommends the wider use of this conservative method. However, if this treatment fails, a surgical intervention is necessary.

## SYMPOSIUM ON DISEASES OF EAR AND SOME COMPLICATIONS

### THE EAR IN ACUTE INFECTIOUS DISEASES\*

A. L. BASS, M. D.

Louisville.

Complications of the ear in acute infectious and contagious diseases are more prone to and do occur much more frequently in infants and children than in adults. Because the child's tissues are more susceptible to infection and have less resistance than an adult they are exposed to infectious diseases more frequently. The anatomical variation in a child from an adult is a factor. The eustachian tube orifice in the naso-pharynx is practically on a level with the floor of the nares and extends horizontal to the middle ear, while in the adult the orifice is about a centimeter above the floor of the nose and extends upward and outward.

Practically all complications of the middle ear in acute infectious diseases gain access through the eustachian tube. The complications of the external ear are practically negligible. On a few occasions I have seen infection of the post-auricular lymph gland either swollen or broken down causing a swelling within the external auditory canal and over mastoid area simulating a furunculosis of the canal and an acute mastoid involvement.

The eustachian tube and middle ear cavity are lined with a richly vascular areolar tissue, which is an inviting host for the various bacteria accompanying acute infectious diseases. The manner in which the various organisms affect the middle ear are characteristic. With scarlet fever or measles if there is otitis media complicating, it is during the process of the disease and it will manifest its presence subjectively with acute pain, often severe; with pyrexia, marked redness of the drum with or without bulging; which will hold fast until relieved with spontaneous rupture of the tympanum or myringotomy is performed, when there will be relief of pain and drop in temperature.

With mumps and especially influenza, the naso-pharyngeal mucosa does not receive as violent trauma from bacterial invasion as from diphtheria, scarlet fever and measles. On the contrary, the mucosa is mildly affected with slight or moderate congestion; and instead of the patient having the above symptoms mentioned, the patient may or may not have subjective symptoms. May complain that the ear feels stopped up; either during the disease or after; or the patient

may not complain at all. The way our attention is drawn to the ear is that the patient will keep up a mild pyrexia for which a cause is sought. Especially is this true of influenza. Upon examination of the tympanum it will not be red with marked congestion, as in the above mentioned diseases, but the drum will appear dull, congested and often bulging.

A report of Roberts is worthy of note. In 828 acute middle ear abscesses he encountered from 1921 to 1925 92% recovered without requiring surgical intervention of the mastoid. It is estimated that about 60% of all acute middle ear infections have mastoid involvement complicating.

Another factor worth while, the drum membrane had been permitted to rupture in 133 cases or 16% before treatment was sought; showing that as a rule patients presented themselves early in the disease. Of the number, 33 came to mastoid operations, or one case in four, while of the remaining 695, which were incised before rupture, 34 came to mastoid drainage, or one case in 20. These figures show plainly the value of early incision of the drum when indicated, instead of depending on nature to establish drainage by rupture of the drum, which in the majority of instances does not give sufficient drainage. In only 34 cases or 4% as reported by Roberts.

The systemic conditions that accompanied these middle ear abscesses were acute rhinopharyngitis (so called head cold) plus influenza, 60%; scarlet fever, 15%; measles, 10%; tonsillitis, 8%; pertussis, nasal diphtheria, sea bathing and pernicious anemia, each 1.5%.

The bacteria present in the 828 cases were streptococcus hemolyticus 57%; non-hemolytic streptococcus, 21%; staphylococcus, 10%; pneumococcus Types Two, Three and Four, each 2.7%.

A word in closing relative to the value of the blood picture in otogenic infections. The otologist does not ordinarily depend upon the blood picture for his diagnosis. The presence of certain change in the ear and definite clinical signs and symptoms, as a rule, are sufficient evidence to determine the course of treatment whether medical or surgical. In some conditions when there is deep seated suppuration, mastoiditis, sinus thrombosis, perisinus involvement, meningitis, etc., the blood picture is not only of diagnostic aid but of prognostic value. While the ordinary blood count is of importance (the leucocyte and differential count), the Schilling Hemogram or count is very valuable. Normally the staff cells range from 2-10% and the segmented cells from 50-70%. Any variation from this is significant.

\*Read before the Jefferson County Medical Society, April 18, 1932.



McKernon found that there is a lower polymorphonuclear count when the bony structure is involved, such as the mastoid; then when the septic process is in soft tissues.

Heideman, from a careful analysis of his own excellent work, states that in some instances the blood picture is normal and the infection severe.

Von Balden from his study, believes that a specific blood picture is not present in ear infections.

External otitis is not associated with any abnormal blood change. Chronic middle ear suppuration does not present any abnormal blood findings unless it is associated with an exacerbation, then it presents the picture of an acute infection.

Rosenwasser and Rosenthal in a study of twenty cases of acute otitis media found W. B. C. ranging from 8,000 to 20,000. Staff cells 9-33%. The hemoglobin and (red cells) erythrocytes are rarely disturbed in ordinary otitic infections, such as external otitis, acute otitis media and uncomplicated mastoiditis. While with infections complicated with bacteremia, such as sinus thrombosis, meningitis, there is a falling in hemoglobin with corresponding drop in the red blood cells.

In conclusion, after all is said and done, clinical experience, properly interpreted is the best judge as to what treatment is indicated.

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#### Pregnancy Glycosuria and Prenatal Care.—

Harding and Selby believe that if all pregnancies or a high percentage of pregnancies show glycosuria and are physiologic in character it seems unnecessary from the purely clinical standpoint to distinguish between a glycosuria and a lactosuria, as usually recommended. If the distinction between dextrose and lactose were readily and clearly made, the authors would advise otherwise, on the grounds of completeness of data. In view of the uncertainty of the distinction by the present suggested tests, they think the wiser course is to assume the presence of a glycosuria.

## MASTOIDITIS FROM THE STAND-POINT OF THE GENERAL PHYSICIAN\*

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In infancy, the mastoid process is quite rudimentary; the cortex is thin, the antrum near the surface, the periosteum not so firmly adherent, and the anatomical sutures are open, making all lines of least resistance lead to safety, or in other words pus to move rapidly away from the brain covering to subperiosteal abscess. When we remember that the bony tympanic cavity in an infant is adult size but that its cavity at birth is practically filled with lymphoid tissue leaving only a tiny air cavity, we can appreciate how thick the drum membrane is and how difficult or impossible spontaneous perforation of the drum becomes. It is small wonder that neglected babies suffer for weeks before the drum spontaneously ruptures, and that in the interim the infection has invaded the antrum and sometimes caused caries, necrosis, cachexia, dehydrating diarrhea, meningitis, etc.

About the fourth year, the mastoid process approximates the adult type. Anatomically there are two types of processes, the pneumatic and the diploic. The pneumatic has the thinner cortex. In mastoiditis, a thin cortex makes the elicitation of tenderness easier. The aponeurosis over the bone shows inflammatory oedema earlier which routinely leads to a quick and correct diagnosis. In neglect, the cortex perforates which reduces the danger of intra cranial complication. In the diploic type, the cortex is thicker. The signs and symptoms of mastoiditis are not so apparent, so that diagnosis is not so easy, and spontaneous fistulization of the mastoid cortex in neglected cases not so prompt. It is very probable that the compact mastoid is a pathological rather than an anatomical type, being the result of chronic mastoiditis since childhood. It is the worst type. It robs the examiner of many diagnostic signs since localizing symptoms cannot present themselves. The current of disease may not be able to move toward the surface but may burrow in and invade the interior of the skull. All long standing cases of chronic suppurative mastoiditis have this type of bone. To make matters much worse, half the cases of chronic suppurative mastoiditis are complicated by cholesteatoma. You may recall that Dr. Shambaugh of Chicago addressed us at the Crab Orchard Meeting and said "Cholesteatoma is dynamite in the head. It

\*Read before the Jefferson County Medical Society, April 18, 1932.

may go off." Cholesteatoma may be diagnosed microscopically by the identification of putrescent exfoliated epidermal and epithelial cells associated with cholesterol crystals. To the laity, the odor is revolting. The parent mass lies in the attic of the tympanum, in the antrum and in the contiguous mastoid cells if any are present. This infected mass grows, fills the cavity or cavities overfull, causes pressure atrophy and infection necrosis. As the inner or brain table is thinner than the outer cortex, the odds are that the meninges, the lateral sinus, the inner ear or the facial nerve will be invaded by the purulent process. Before the picture has become this bad, there have been years in which to make an easy and correct diagnosis and to do the indicated radical mastoidectomy. It is often said that there are too many mastoids operated upon. In the way it is meant that is true, but I am positive that we do not do half enough if the operations could be distributed to the right people at the right time. There are lives to be saved, deafness to be relieved, morbidity and ill health to be cured, uninsurable men and women to be made insurable by treating osteomyelitis of the temporal bone by the same surgical principles that are employed in other less vital parts of the body.

To me, the temporal bone is the most interesting bone in the body. Its suppurative diseases have been seriously studied for one hundred and fifty years. As we grow into the subject, we find that the difficulties of estimating the pathological conditions or processes inside the cortex multiply. On the other hand certain phases become quite simple and certain confusing matter is found to be extraneous. Beginning with the extraneous, I can correctly say that most patients who come to me for what they call "mastoid" have no mastoid condition at all. Their symptoms can be divided into two groups: Pain and swelling in the ear region. The pain may be referred from teeth, mouth, throat, chest, neck, scalp, sphenoid sinus or by inference, if I cannot find a cause, neuralgia or neuritis. Impacted teeth, teeth with dying nerves, and teeth with pulp stones are the usual dental causes. While there is no absolute consensus of opinion as to where an infected sphenoid sinus refers its pain, my present belief is that it is usually behind the eye and to the mastoid region of the same side.

Cervical lymph adenitis which has been so prevalent for the past two years often causes otalgia. When nature made the mistake of packing paranasal sinuses, tonsils and adenoids and mastoid cells into Pandora's box, she somewhat compensated by placing almost

half of the lymph glands of the body into the neck as fortifications to protect the heart, kidneys, lungs, et cetera. A portion of the lymphatics of the scalp drain into the lymph glands which lie over the mastoid bone. Glandular swelling here points to a lesion of the scalp above.

Primary acute periostitis of the mastoid process is caused by trauma, syphilis and tuberculosis. It is rare. If severe it causes considerable headache, pain and stiffness of the neck and low fever. The ear drum and external auditory canal are not involved.

Secondary periostitis of the mastoid process may result from purulent otitis media or mastoiditis when pus burrows to it by the several routes. It is more frequently due to furunculosis of the external auditory canal.

In nearly every case of furuncle of posterior wall of the external auditory canal, the mastoid periosteum is inflamed and sometimes swollen to the extent that the outer ear is displaced, simulating subperiosteal abscess due to rupture of the mastoid cortex in acute suppurative mastoiditis. Furunculosis is a common complication of suppurative otitis media which may or may not have gone so far as suppurative mastoiditis. It may be due to swimming or meddling with the ear canal, either with or without antecedent suppurative otitis media. If it is remembered that the furuncle or furuncles in the canal often close the canal so tightly that the drum cannot be inspected, that the patient has no talent in autobiography, and that a radiogram through the periostitis or subperiosteal abscess is relatively unsatisfactory, it is no wonder that most God fearing otologists at some time or other have honestly made the mistake of doing mastoidectomy on pure furunculosis cases. The best guide we have in the differentiation is manipulating the external ear. If there is much pain we can infer furunculosis. When there is a mixed condition of both furunculosis and suppuration of the middle ear, the treatment is complicated. Before leaving the subject of pseudo-mastoiditis, herpes and oedematous dermatitis of the mastoid region are to be mentioned.

Hemorrhagic blebs of the external auditory canal and drum head are pathognomonic of influenza. They are often unassociated with middle ear disease. Great pain lasting a few days is a usual symptom. It is obviously true that deaf boiler makers, patients deaf from oto-sclerosis and auditory nerve atrophy with histories negative all their lives for middle ear suppuration; with ears clinically negative for inflammatory signs and symptoms, and negative roentgenograms have not got mastoiditis, can only be made worse



by mastoidectomy and each repetition of the operation is an overt act of knavery.

In Kopetsky's *Otologic Surgery*, in the chapter on "The Simple Mastoid Operation" he begins with a historical sketch. The facts for the following quotation he got from J. C. Tode, *Arzneikundige Annalen*, Copenhagen, 1792 (*Annals of Disease of the Ear*): "The imperfect knowledge of the pathological anatomy of the ear produced a series of indications for the operation which was largely a matter of guess work and brought its train of unfavorable results. To these, the unmerited blow dealt the procedure by the death of Baron Berger, the personal physician to the King of Denmark who, submitting to the operation because of severe tinnitus and difficulty of hearing, died a victim of poor technique and injudicious after treatment, caused prominent general surgeons and authorities in otology to decline to sanction the operation. Notwithstanding the occasional favorable reports and the endorsement of Von-Troltsch whose work was based on scientific pathological research, the operation remained in disuse for the following decades." In 1932, there is no chance of honestly making the evolutionary mistakes of 1792.

#### NOW ABOUT MASTOIDITIS.

It would be curious if, after 150 years of research and clinical experience, suppurative mastoiditis were not divided and then subdivided into various types and such is the case. Naturally there is traumatic, syphilitic and tubercular mastoiditis just as there is traumatic, syphilitic and tubercular everything else. There is naturally primary mastoiditis which is rare and is caused by septic germs carried by the blood stream to a part where conditions for reproduction are favorable. We mostly see secondary mastoiditis, which is secondary to influenza, the exanthemata, typhoid and pneumonia. Anatomically, it is secondary to acute infection of the naso-pharynx, through the eustachean tube, through the tympanic cavity, through the aditus to the mastoid antrum and its contiguous secondary cells. Anatomical peculiarities of each individual temporal bone (the pair of bones is symmetrical in over 90% of cases) have about as much to do with the character of local reaction to pyogenic infection as the type and virulence of micro-organisms or the constitutional characteristics of the patient. It would be unhelpful to us now to go into anatomical, bacteriological or pathological minutiae. As to constitutional elements, you tell us that, but it is with regret that I realize that I know "more and more about less and less." Bacteriologically, every suppurative otitis media is a suppurative mastoiditis. Pathologically, every suppurative otitis media is a suppurative mas-

toiditis, at least very superficially. Roentgenologically, I believe we could find evidence of mastoiditis in each suppurative otitis media.

Clinically I am sure I can demonstrate one or more mastoid signs or symptoms in each suppurative otitis, and I can infer more.

It so happens that the mastoid has its chance to resist and to resolve just as every other part has, so that unless there is more than a skirmish, we have no clinical mastoiditis. The diagnosis of mastoiditis once spoken to the patient means to him a mastoidectomy. To me it does not routinely indicate any such specific line of treatment. It does indicate rest in bed, adequate elimination, appropriate diet, appropriate medication to the responsible disease, appropriate treatment to the nose and throat, establishment and maintenance of a sufficiently large perforation in the drum, emptying the external auditory canal of all discharge at least twice a day, resting the head with the affected ear down so that even gravity will pull for the patient. Symptoms must be sought, anticipated, weighed and measured. The kidneys must be watched for inflammation. It has been my experience to find albumin in most mastoid cases and I wish it were possible to know whether the causative disease or the mastoid were responsible. Fever is a variable symptom. An uncomplicated mastoid should not register temperature over 102° F. If it does, be apprehensive of intra-cranial complication. The difficulty again is that we are unable to know if the fever comes from the causative disease, the mastoid or some other coincidental complication. Many mastoids, even those going the full course to operation, register no fever. The absence of fever may be due to lowered resistance, or be characteristic of that type of case. In other words the absence of fever may be a bad sign and at least it does not contra-indicate surgical interference. We have all seen dura exposed by necrosis and yet no fever. A chill is very significant in mastoiditis. At one time it was supposed to mean thrombo-phlebitis of the lateral sinus. Now it is known that the smaller veins in the mastoid area may also produce the chill from the same process. Where ever it comes from, it is alarming and should be investigated by x-ray, by Schilling differential count, by blood culture, if in doubt by the anatomical simple or radical mastoidectomy with extensive removal of the inner plate over the lateral sinus. If in doubt again the temperature can be watched for septicemia over a period. If it continues to be septic the internal jugular should first be resected then the lateral sinus opened and the clot removed. Pain is a valuable symptom. It may be mostly tempermental. It may be earned.

If it persists over several days after everything else has been done to facilitate drainage, mastoidectomy is indicated. Painful days with more painful nights, insomnia, poor feeding with loss of weight and anxious expression demand operative relief. Still many ears which cause no pain are as extensively diseased. In fact the coalescent type which practically does the mastoid operation, if allowed to do so, causes little or no pain. It is characterized by excessive discharge. At Camp Taylor during the influenza epidemic when the operative ban was on, those flu-pneumonia - measles - pneumonia mastoids drained a streamlet of pus down the pillow into a puddle on the floor, as many of us can remember. When the War Department gave the doctors back their brains and hands, those patients, or what was left of them, were operated at the rate of 10 to 15 a day. They were pianolas to operate. Most of the cells were destroyed. Dura was often found to be exposed. Why these cases are painless is not explained. Tenderness if persistent is a valuable sign. Its absence should not cause too much optimism as we have repeatedly seen cases go to operation which according to all the laws of logic should have registered tenderness and did not. Many otologists consider persistent pain as the most reliable single indication for mastoidectomy, evidencing purulent infection under high pressure in a vital spot.

X-ray is of great value. It reveals the topography perfectly, showing type and extent of cells and the position of the lateral sinus. It often reveals the pathological condition exactly as we find it on operation and sometimes it is not nearly that good. Successive examinations, following the disease, are advantageous.

The Schilling white count philosophy has been a great boon to us too. I feel that when the dura is approached, the count will give the warning.

In closing, if I haven't, I would like to make the point that no sign or symptom can be depended on to be present to confirm the diagnosis of operative mastoiditis in a given case. In fact only one of the cardinal signs may be present but according to the course of that particular case in that particular epidemic, it will be sufficient.

A rare and devastating type of mastoiditis is the hemorrhagic type. It runs a quick course toward thrombo-phlebitis, meningitis, acute type of brain abscess unless quickly operated. And operation may not control the complications. In its rapid, stormy course, it runs the gamut of all signs and symptoms of mastoiditis except perforation and subperiosteal abscess. All other types give us time

for deliberation. Nature aided by conservative treatment cures half the cases of clinical acute mastoiditis. Mastoidectomy is the only conservative treatment for the other half.

### ETIOLOGY AND DIAGNOSIS OF INTRACRANIAL COMPLICATIONS OF DISEASES OF THE EAR AND MASTOID\*

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This paper deals with intracranial complications resulting from infection in the ear and mastoid as far as the etiology and diagnosis is concerned. We therefore presuppose a suppurating ear, either acute or chronic. Too much emphasis can not be laid on a careful, intelligent history taking. This should be gone into in detail. If the case is acute, a day to day chronology should be followed from the onset of the disease. It is important to note what initiated the trouble. Did it begin from a simple infection or a severe one? Was it due to one of the infectious diseases, measles or scarlet fever? What has the temperature been? A graphic chart, if procurable, is often of great benefit. Has there been a chill and was it repeated? How much headache has there been, where located, when worse? Has there been dizziness? Was it severe? Was it made worse by change in position? Has there been vomiting? Was it independent of food or fluid intake? Have there been any convulsions? If a previous operation has been done the operative findings are important; whether there was exposure of the sinus or the dura above the antrum or tympanum; what was its condition?

If the ear is chronic, of what duration; the character and amount of discharge; has there been previous treatment; dizziness, and its character; headache, and its character; a previous history of labyrinthitis; whether there has been a change in the disposition, habits, and mentality of the patient. Functional hearing tests and tests of the canals if possible should be done. This history taking, as I said, can not be too strongly emphasized and is spoken of by Eagleton who has a very comprehensive chart for such cases at the Newark Eye and Ear Infirmary.

In all of these complications the underlying pathology and to a certain extent the etiology is similar. The extension of the infection from the middle ear or mastoid may come from progressive necrosis of tissue; from thrombo phlebitis of small venous radicles leading into the lateral sinus or men-

\*Read before the Jefferson County Medical Society



inges; pressure from extensive cholesteatomatous masses; the presence of a dead ear showing infection that has extended through the labyrinth.

**Sinus Thrombosis — Sinus Phlebitis.** This is the most frequent of the intracranial complications; it also offers most favorable results from treatment.

**Pathology and Etiology.** This may arise from a direct extension backward; from diseased bone; from a peri-sinus abscess; or from thrombo phlebitis of small venous radicles within the mastoid extending into the lateral sinus.

**Symptoms.** First, those due to a periodic discharge of septic matter into the general circulation. This constitutes the classical chill, fever, and sweat, with which we are all familiar. It is well, however, to note that whereas in adults and older children there may be a well marked chill lasting from fifteen to thirty minutes, in young children this may be indicated only by a coldness of the hands and feet. If the case is one following a chronic ear or in a case following a mastoid operation where the temperature had previously been normal, the fever from the normal point will rise sometimes as high as 105° or more. It will stay at this point for a few hours and a decided drop will occur followed by a profuse sweat.

If the case is one of mastoiditis, which has not been operated on, the temperature will show a sharp rise but not a drop to normal or below as in the other case, being held up by the other areas of infection not yet drained. Succeeding this will be a period in which the patient acts and feels practically normal. The repetition of this syndrome depends upon the severity of the infection and the frequency with which this septic material is discharged into the general circulation.

Second, symptoms that are due to disturbances of the cerebral circulation. First, headache, which may be severe and located on the side of the affected sinus; there is occasionally nausea and vomiting; Papilledema occurs at times.

Crowe's sign, a papilledema coming on following pressure of the unaffected jugular I have never been able to elicit, though I have tried on a number of occasions.

Greissinger's sign is an area of oedema around the mastoid emissary vein. It is not to be confused with the subperiosteal abscess.

Third, changes in the blood. Most observers note a moderate leucocytosis up to twenty thousand in uncomplicated sinus thrombosis. The Schilling count gives us considerable information relative to the progress of the case and should be done often. Counts show a progressive decrease in the red cells. Blood

cultures should be taken early and repeated and a positive blood culture, particularly if yielding a streptococcus, makes the diagnosis certain.

Fourth, changes in the sinus wall. If the case has been previously operated on and there has been present a perisinus abscess, or, if the sinus wall, being uncovered, instead of the normal blue appearance has shown a dirty gray discoloration, or a sodden, water logged appearance with a doughy feel, or if there has been an actual necrosis of the wall, all of these are of considerable importance.

After a case has run on for several days unrelieved we may have metastatic processes. These occur most frequently in the joints but may also occur in the soft tissues.

The symptomology of this condition would not be complete without a description of the Queckenstedt test. This is done by employing a spinal manometer. The needle is placed in the spinal canal and the pressure read by the manometer. Firm pressure is then made over the jugular on the affected side; if the sinus is thrombosed there should be little or no alteration in the manometer reading; if the sinus is open there should be a moderate rise in manometer pressure. Pressure is then made on the jugular of the unaffected side. If there is a thrombosis on the opposite side a very sharp rise in the manometer reading will result, whereas, if the other side is open there will be but a moderate rise in the manometer reading. The value of this test is unquestionable, but it is not infallible. I have had one case in which this test showed a thrombosis of one side that cleared up without further trouble and other men have reported such cases. In this connection it is to be remembered that occasionally there are marked anatomical variations of the two sides and that occasionally we have an aseptic sinus thrombosis that subsides without treatment.

**Abscess of the Brain.** The following statistics if borne in mind will help materially in these cases. According to the various observers, abscess of the brain occurs after chronic ears in between 80 and 90 per cent; after acute ears, in 20 to 10 per cent. They occur most often in men, about 70 per cent; to women, 30 per cent. It occurs most often between the ages of ten and thirty. As to position, temporo sphenoidal lobe abscesses occur in about 65 per cent while those of the cerebellum occur in about 35 per cent.

**Pathology.** The extension from the ear or mastoid may take place through the erosion of a bony plate, the tegmen antri, or tympani, or behind the lateral sinus. There may have been an extra dural abscess or localized meningitis welding the bone, dura, and brain sub-

stance together. There may have been an extension backward from the lateral sinus or through the labyrinth, or there may have been a thrombo phlebitis affecting the terminal vessels.

Just a word about extra dural abscess. This is rarely diagnosed except at operation. Symptoms which sometimes indicate its presence may be a severe localized pain, a severe headache on the side of the lesion, or an elevation of temperature beyond that which would be accounted for by the other local pathology. Usually exposure and drainage of the abscess results in a cure.

In the formation of a brain abscess we recognize various stages and this emphasizes the need of a careful history taking as spoken of before. First, the initial stage. This is almost invariably announced by a chill or rigor; temperature, sometimes of considerable degree, and severe headache; vomiting, with or without nausea, may or may not be present. These symptoms are usually of short duration and unless they occur during the time the patient is in the hospital may be attributed to other conditions not connected with the ear. Following the initial invasion, either very closely or after some lapse of time, the symptoms of the second stage or fully formed abscess appear. These are grouped under the symptoms of intracranial disturbances or compression, symptoms due to septic absorption, and focal symptoms. At the first, then, we notice headache which is of a dull, boring type, persistently recurring and in most cases worse at night, preventing sleep. Insomnia is often complained of which is not altogether due to pain, or, when sleep occurs it is apt to be fitful, easily broken, so that the patient awakens unrefreshed. The temperature is usually normal or subnormal. The pulse undergoes a gradual slowing; mental dullness is prominent and there is an inability to undertake any sustained mental exertion. Questions are answered slowly though often correctly after a considerable interval. Changes in the eye grounds occur most frequently in posterior fossa cases. The pupils are sometimes affected, usually on the side of the lesion. The pupil may be either contracted or dilated but the action is usually sluggish and not as active as the other side. Vomiting is much more apt to occur in cerebellar abscess than temporo-sphenoidal abscess.

The symptoms due to septic absorption show in a progressive and in some cases rapid loss of flesh and strength, or in an appearance of grave illness as compared with the symptoms present. The focal symptoms occasioned by these conditions could be much more intelligently discussed by the neurologist.

In temporo-sphenoidal abscess we may have muscular spasms, muscular paresis, or localized paralysis on the side opposite the lesion. If the trouble is in the left hemisphere, types of aphasia may be present. In cerebellar abscess muscular paralysis is a rare symptom. The focal symptoms arising in this situation are the incoordination ataxia, on the side corresponding to the lesion, diadokokinesis, loss of the sense of position, disturbance of static equilibrium, subjective vertigo, and nystagmus.

A word regarding the nystagmus. While of a vestibular type and slowly rotatory in character it very frequently changes and is usually progressive and increasing, all of this being in contradistinction to the nystagmus of labyrinthitis.

In reference to the ataxia present, the patient's falling or tendency to fall has no connection with the slow component of the nystagmus. Kerrison states that when disturbances of equilibrium is a prominent and constant symptom, the direction in which the patient falls or tends to fall is constant and is for the most part independent of the nystagmus present. It should be remembered that the muscular weakness, incoordination and disturbed orthroidal sense are always homolateral, that is on the side of the lesion.

In distinguishing between the temporo-sphenoidal and cerebellar abscess we should note that in cerebellar lesions, headache, vomiting, eye-ground changes and vertigo are apt to be more severe than in the other; that muscular weaknesses, when they do occur, occur on the side of the lesion; that mental dullness and slow cerebration, failure of sustained attention, and the various types of aphasia are characteristic of temporo-sphenoidal abscess; that muscular disturbances occur on the contralateral side of the body.

Meningitis. A tremendous amount of work, both clinical and experimental, has been done on this subject in the past ten years, without however getting beyond the threshold of its solution.

Eagleton's often repeated assertion is that every case of meningitis is at some time a local process. If it were possible to trace the pathway of infection and open up the basal cisterns that received this infectious material before it became diffused we would appreciably increase our percentage of cures. Unfortunately we are not able to do this and when the disease becomes the acute diffuse type there is very little hope for the patient.

We recognize various types of the disease. First, the circumscribed pachy meningitis, similar to extradural abscess, may cause no symptoms at all and usually subsides promptly on exposure and removal of diseased bone.

Lepto Meningitis, circumscribed and dif-



fused. Serous meningitis, or meningo-encephalitis. The pathology is similar to those other lesions which we have taken up. The infection may take place by direct extension, through contact of necrotic bone with the dura, or erosion of the inner table at some point; through an infected labyrinth.

There may be three points of entrance; by way of the nerve channels opening into the internal auditory meatus; by the aqueductus vestibuli or the aqueductus cochlea which communicates directly with the subarachnoidal space.

Finally, as a terminal process in abscesses of the brain. In the acute cases the disease is usually initiated in by a chill, sharp rise of temperature commonly followed by vomiting; the pulse is rapid; face flushed; patient is restless and irritable. This is succeeded, after several days, by rigidity of the muscles of the back and neck; rigidity of the muscles of the leg. Kernig sign; photophobia; strabismus; mental stupor or active delirium. The restlessness and irritability increase and are succeeded by coma. The blood shows a high white count, up to 35 or 40 thousand, the cells being mostly polymorphonuclear leucocytes.

Lumbar puncture. This is by far the most important diagnostic measure and its use instead of being deferred until well marked symptoms are present should be instituted early, at the first signs of cerebral irritability. Without going into detail as to the normal spinal fluid we know that in meningitis the cells are increased, bacteria may or may not be present; that there is an increase in globulin, and a decrease in sugar. Daily studies of the spinal fluid give valuable information as to the progress of the disease and in certain types, such as the serous meningitis, may have considerable curative influence as well. The cell count obtained is of considerable importance. The cloudy, purulent fluid seen in meningococcal and streptococcal meningitis has almost 100 per cent polymorphonuclear cells whereas in tubercular meningitis the fluid may be almost clear or opalescent and the cells almost wholly mononuclear.

In a case of meningitis therefore, if successive lumbar punctures show increased cells, increased bacteria, increased globulin, and absence of sugar, the case is growing progressively worse.

If on the other hand, the bacteria disappear, the cell count diminishes, globulin diminishes, the sugar reappears, the case is progressing favorably.

Petrous tip suppuration. This subject has attracted considerable attention during the past few years. It is an explanation of certain cases that succumb to a terminal meningitis. Popetzky and Almour, who have

made a study of these cases, state that all the cases seen have shown an extensive pneumatization of the mastoid; large cells in the zygoma, around the tubes, in the solid angle, and surrounding the base of the petrosa.

The cases show four distinct periods. First, canal discharge and eye pain. Period of low grade sepsis. Quiescent period. Period of diffuse lepto meningitis.

Eye pain is the first symptom to appear; it is on the side of the lesion and is described as a deep seated ocular pain, nocturnal in character at its onset. It is due to the irritation of the ophthalmic branch of the fifth nerve.

Aural discharge. In these cases the ear does not cease to discharge after operation, or after an interval of dryness, a spontaneous, free discharge comes again from the middle ear, coincident with or before the orbital pain. In addition to these symptoms there may be slight facial weakness, slight vertigo, and nystagmus; occasional vomiting spells. This is succeeded by a period of low grade sepsis, fever ranging from 99° to 103°.

The laboratory data furnished by these cases is negligible. The x-ray study is of considerable importance showing cells extending into the petrous tip. Following this there is a deceptive interval of quiet after which a terminal meningitis develops.

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**Spontaneous Nontuberculous Pneumothorax in Nurslings.**—Gardere and Sayyoe state that spontaneous nontuberculous pneumothorax is not very rare in early infancy and it is more frequent than tuberculous pneumothorax. It appears especially in the course of pneumonia, bronchopneumonia or pulmonary abscess, often secondary to one or another of the infections. The symptomatology varies with the intensity of the functional signs, the casual disease and the evolution. It may take the form in which the distinct clinical characters may be recognized at the bedside, or the pneumothorax may be more or less latent and can be recognized only in the roentgenograms. The transformation into pneumothorax is the course of bronchopneumonia with pulmonary abscess is frequent and often fatal. The prognosis depends on the causal infection. In the course of pulmonary infection with medium intensity and favorable prognosis, the pneumothorax itself cannot be considered a serious aggravation and, in spite of early age, is well tolerated and improves rapidly. The presence of an extravasation, in the case of hydro-pneumothorax, is not an aggravating circumstance unless the liquid becomes purulent. Treatment consists of inhaling large doses of oxygen, and tonic cardiac and sedative medicaments to attenuate the intensity of the dyspnea.

## TREATMENT OF INTRACRANIAL COMPLICATIONS FOLLOWING EAR AND MASTOID INFECTIONS\*

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and

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### INTRODUCTION

Intracranial complications of otitic and mastoid origin for which we wish to consider briefly the therapeutic measures are: 1. Brain abscess, which includes both cerebral and cerebellar abscesses. 2. Generalized septic meningitis. 3. Purulent pachymeningitis (intradural). 4. Serous meningitis.

Otitis media and mastoiditis are the primary sources of almost 60 per cent of all brain abscesses. From very careful necropsy studies on 109 cases of this type, Evans of London found approximately 56 per cent to be cerebral, 37 per cent to be cerebellar and 7 per cent to have both cerebellar and cerebral abscesses. For every 3 cerebral abscesses, there were 2 cerebellar abscesses. Fifty-six of the 62 cerebral abscesses were situated in the temporosphenoidal lobe. Approximately 90 per cent of the cerebral abscesses, secondary to otitis media and mastoiditis, were located in the temporosphenoidal lobe. This lobe lies directly over the tegmen tympani through which the infection passes by direct extension in a large majority of cases. The cerebellar abscess, on the other hand, most often follows mastoiditis and its complicating conditions and enter the cerebellum in most cases by way of the sigmoid groove.

Assuming that the primary focus of infection, whether it be ear or mastoid or both, has been adequately cared for, eradication of the abscess remains. This may be a long and difficult procedure. Primarily, the course will depend upon the nature and virulence of the infection, as well as the general condition of the patient and his reaction to the particular organism. The usual organisms are streptococcus, staphylococcus and pneumococcus or some combination of the three.

The primary motive in treatment is to afford drainage with as little damage to the brain tissue locally and to the patient generally as is possible. Every precaution must be used to prevent the spread of the infection by way of the subarachnoid space or into the ventricles either by direct extension of the abscess or because of operative procedures. As a rule, it is better to treat the patient palliatively with active supportive measures until the inflammatory process has become chronic and well walled off. While this is taking place, the most rigid scrutiny

must be kept for signs that would necessitate immediate interference. A sudden or a gradual change for the worse clinically, such as an increase in temperature, vomiting, headache, drowsiness, delirium or loss of strength may preclude further waiting.

The state of the eyes, as determined by repeated perimetric examinations, is of utmost importance in estimating the activity of a temporosphenoidal abscess. The common perimetric picture of this lesion is a homonymous defect in the superior quadrant. Should it be found that the homonymous quadrant defect is gradually enlarging from day to day to include the lower quadrant, certainly the abscess is becoming larger and should call for immediate operation.

Furthermore, the perimetric field defects will indicate the approximate level of the abscess. A superior quadrant defect places the lesion in the lower portion of the temporosphenoidal lobe, while a homonymous inferior quadrant defect points to a lesion higher up in the same lobe. The perimetric field, then, is a good aid in placing the incision for drainage. It must be realized, however, that not all patients will be able to cooperate sufficiently to enable one to take a field, but attempts made from day to day, often on the sickest patients, will eventually be rewarded with a cooperative period when a field may be secured.

The opportune time for operative interference has arrived. There is no set time interval. Each case has its own specific determining factors as to when operative measures must be instituted as well as to what type of operation is required. The septic mastoid wound is well sealed off by placing gutta-percha over the wound and pressing lightly around the margins with a hot saline sponge which causes the gutta-percha to melt and become securely sealed. It is always best to make a small incision through the scalp in a clean field directly over where the abscess is thought to be. A small burr hole is made in the skull and enlarged with rongeurs if necessary. The meningeal interspaces are sealed with a coagulating current, and the dura is incised with an electric knife. This prevents subsequent contamination of the subarachnoid space. If an abscess lies beneath, the cortex will bulge through the dural opening and further serves to prevent contamination of the subarachnoid and subdural spaces. Then with a ventricular needle, the abscess wall is encountered and pierced. The pus is allowed to flow out of the needle into a medicine glass and at times slight suction may be employed by means of a luer. This suction should by all means be very carefully applied.

\*Read before the Jefferson County Medical Society,



The patient usually shows some temporary relief of symptoms after the drainage of the abscess, but in the majority of cases, the cavity refills with pus and the symptoms return. There are a few, however, that never require further aspiration, and a few more that will recover after two or three aspirations. These subsequent aspirations may be performed in bed, and at the most may require a little novocain infiltration along the margins of the scalp wound before the ventricular needle is inserted.

However, if it is found that the organism is virulent, and the cavity continues to refill after repeated aspirations, a tube may be inserted under direct vision, or the wall of the abscess may be incised and sutured to the scalp, affording open drainage, or one of the various mechanical devices such as the Mosier cone and the wire basket may be employed. Which one used will depend upon the particular need and the surgeon's judgment.

A very minor operative procedure may in a certain instance be a radical operation, and vice versa, all depending upon what is necessary to secure the desired result, namely, a cure. Certainly, one would not want to turn down a bone flap, or sacrifice a large area of the skull with biting rongeurs, or remove a lobe of the brain if as good results can be secured by a less destructive and by a less exhaustive operation to the patient.

There is one factor which I think will be well to mention at this time, and that is the employment of air for the visualization of the size, extent and the exact position of the abscess cavity. It can be used as a valuable adjunct before attempting to uncover the abscess and establish permanent drainage. It will make possible the utilization of the nearest point of the abscess to the surface, and, hence, less destruction of the brain as open drainage is established.

**Cerebellar Abscesses.** It has been our experience that cerebellar abscesses recover with less extensive treatment; usually, one or two aspirations are all that are necessary. Out of five cases of cerebellar abscesses treated, four recovered with not more than two aspirations, and the fifth recovered after the insertion of a small tube for drainage. In dealing with cerebellar abscess, it is especially important that the subarachnoid space is well walled off before any attempt at aspiration is made, because there always seem to be fewer adhesions and more subarachnoid fluid present in this region.

**Meningitis.** Let us consider briefly the treatment for the common forms of septic meningitis which follow ear and mastoid infections. These are streptococic, staphylococic and pneumococic meningitis. For streptococic and staphylococic meningitis,

continuous drainage of the spinal fluid has given the best results in our hands. This may be accomplished by one of two methods; namely, a laminectomy with the insertion of a drain in the subarachnoid space, or by insertion of a canula without a laminectomy into the subarachnoid space.

The laminectomy and drainage may be performed at the level of the first lumbar vertebra or in the cisternal area. If performed below, the level of the first lumbar vertebra is used because of less likelihood of the nerve trunks to herniate through the drainage wound.

In the canula method, an especially constructed instrument is used. It may be made in various sizes. However, we usually use a size No. 10 French, the length varying with the thickness of the soft tissues of the patient's back. It has a flange on the outer end to fit against the back. It is best introduced in the lower lumbar region. It affords continuous drainage of spinal fluid as does laminectomy, only it is a much simpler procedure and can be used on very sick patients with very little disturbance. We have never used continuous drainage unless the organism had been definitely identified as streptococcus or staphylococcus.

Continuous spinal fluid drainage affords an avenue of escape for the products of inflammation. It helps to reduce the swelling and edema that accompanies the inflammatory process. The patient feels much better after the relief of the increased intracranial pressure which is usually present in cases of meningitis. It is very important in this form of treatment to keep the fluid intake around 5000 c.c. per 24 hours. With a high fluid intake, there is an increase of spinal fluid output with continuous drainage, which acts as a lavage to the subarachnoid space.

We have employed this method on 33 cases of septic meningitis, non-meningococic in origin, with 9 recoveries. This gives a recovery rate of a little more than 27 per cent of cases with streptococic and staphylococic meningitis.

We wish to make only a brief remark concerning the treatment of meningococic meningitis. Serum administered by the cisternal route has been thought to be more efficacious than when given by the lumbar route. It will become more thoroughly disseminated throughout the subarachnoid spaces. Very good results have been obtained by the ventricular introduction of serum through a small burr hole in the occipital region with simultaneous lumbar drainage, allowing the fluid to enter above and drain out from below. It is our personal opinion that this method will give a higher percentage of re-

coveries than any of the other methods of administration of the serum.

Until about 18 months ago, the treatment of pneumococcic meningitis, in our experience, always has been quite a discouraging procedure. At this time, we started treating these cases with ethyl-hydrocupreine or Optochin Base by mouth in conjunction with spinal punctures. Out of 5 cases of pneumococcic meningitis treated this way, 3 have recovered. This is not a large enough series from which to draw conclusions. The organisms were cultured and identified in each case. The day after the administration of the Optochin Base, each case that recovered showed a marked fall in temperature, and there was a like pronounced improvement of the patient's clinical condition. There was a decided reduction in the number of cells in the spinal fluid.

It is known that Optochin Base has a high germicidal value for pneumococcic organisms in vitro. It may be that the usual intravenous or intra-arterial administration with serums or intraventricular injection does not afford the necessary continued concentration in the blood stream and places where needed. The oral method permits regular administration at certain time intervals with a given absorption and dilution as determined by the intake of only 5 ounces of milk with each dose. There is nothing else taken by mouth during the administration of the drug to affect its dilution or assimilation.

**Purulent Pachymeningitis.** Now let us consider briefly the two less frequently encountered complications of ear and mastoid infection: i. e., purulent pachymeningitis and arachnoiditis. The former may simulate temporoparietal abscesses except that the temperature is usually higher and the condition more fulminating. Pus accumulates beneath the dura and may or may not be walled off. If the process is not walled off, a pyocephalus soon results and little can be done. If the pus is localized, opening of the dura and drainage is indicated. Further exploration for a suspected deep-seated brain abscess should not be attempted.

Arachnoiditis oftentimes follows mastoiditis and may simulate a cerebellar abscess. Meningeal signs with increased cell count in the spinal fluid with lack of focal signs will permit one to recognize the condition. Palliative treatment is all that is necessary unless signs of marked increased intracranial pressure should be present. This usually results from adhesions in the region of the fourth ventricle with blockage of spinal fluid circulation. A suboccipital decompression with opening of the dura and breaking up of these adhesions is important. Complete relief usually follows. This should be per-

formed before the increased pressure has caused permanent damage to the eyes.

#### SUMMARY

1. Brain abscess should be allowed to become chronic.
2. The type of operation should be selected carefully; many times the simplest of procedures will prove sufficient.
3. Open drainage is advocated for septic meningitis.
4. Pneumococcic meningitis is treated with oral administration of Optochin Base.
5. Purulent pachymeningitis and serous meningitis are discussed briefly.

#### DISCUSSION

**S. G. Dabney:** I have greatly enjoyed these papers; all of them seem to me excellent. A word or two first about Dr. Bass' on otitis media.

All are familiar, particularly pediatricians, with the aural complications of the acute exanthemata. On reviewing the statistics on this subject I was somewhat surprised at the report of Duell. On examining 6,000 cases at the Willard Parker Hospital of contagious diseases he found otitis media occurred in 5% of measles, 10% of diphtheria, and 20% of scarlet fever.

I think Dr. Bass is to be commended for emphasizing the anatomy of the ear in infants; in them, as he stated, there is really no mastoid process, but the mastoid antrum is fully as large as it is in an adult; it has been proposed to call these cases of infantile diseases "anthritis" instead of mastoiditis. This disease is not uncommon, and I have seen several cases where the bone was perforated and a sub-periosteal abscess formed with only slight preceding symptoms.

An interesting contribution to the ear complications in infectious diseases is the recent statement of Dr. Shambaugh that profound deafness following scarlet fever is due not to suppurative otitis media, though that may co-exist, but to an inflammation of the auditory nerve caused by the toxemia of the disease.

Dr. Bass wisely emphasizes the importance of early incision, but I wish he had referred also to the after treatment. Some prefer douching the ear gently with normal saline solution or other simple cleansing agents and then carefully wiping it dry, while others simply wipe the ear dry as possible and then pack a little wick of sterile gauze down into the auditory canal to the drum membrane, changing it as frequently as necessary. It seems to me that the objection to this last procedure is that the wick is not apt to be properly applied except by the Doctor or a well trained nurse.

Now as to indications for operation in acute mastoiditis: It might be thought that in a disease so long studied there would be a general consensus of opinion; this, however, is not true. There are some who think that pain, tender-



ness, profuse discharge, and perhaps slight fever call for operation in the first week, and there are others who think it wise to wait several weeks. Dr. Dean talked interestingly on this subject, and I think prefers late operation—we would be glad to hear from him further in closing. Personally, I think the middle ground is the wiser; namely, to operate if the symptoms persist after ten or twelve days.

I believe Dr. Dean said if he had to pick out one symptom of most importance it would be pain, but in my experience I believe I would choose as the chief single symptom, persistent tenderness on deep pressure over the mastoid. It is common to find this and other mastoid symptoms for the first week in any severe case of suppurative otitis media, but the persistence of such symptoms for ten days or longer is very suggestive of genuine mastoiditis; this is true also of late pain and tenderness occurring a week or more after the beginning of the suppurative otitis media.

I have seen two cases of Gradenigo Syndrome, acute suppurative otitis media, pain in the temple and paralysis of the external rectus muscle—both recovered without operation and both had a second attack occurring many months or perhaps a year afterwards which also recovered without operation; both occurred in children under fourteen years old.

Now just a word or two in regard to lateral sinus thrombosis: Don't forget erysipelas. I've seen two cases in which the subsequent course of the disease seemed to prove that the erysipelas was the cause of the whole trouble. It may also, as I understand it, cause the streptococcus in the blood.

Finally, a word as to the diagnosis in those cases in which the sinus is opened and no clot found; it seems to me that in these cases the diagnosis is not conclusively established, even though the symptoms improve and the patient gets well.

**W. R. Pryor:** With practically every middle ear abscess there is some involvement of the mastoid cells. This may be a mild inflammatory reaction in the mucosa or an exudate, depending on the virulence of the organism and the resistance of the host. In only a small percentage of cases does this result in a clinical mastoid. Abscess in the middle ear has been often treated by phenol drops and the drum allowed to rupture spontaneously. This is usually accomplished by a small perforation in the anterior inferior quadrant which does not provide sufficient drainage. Also, it heals very easily allowing a recurrence of the pus under pressure and makes Mastoiditis much more likely than following the usual wide paracentesis in the posterior inferior quadrant.

Certain signs and symptoms present themselves during middle ear or mastoid infection

which alarm the general physician, but do not have the grave import of other less striking ones which may entirely escape his notice. As he is often the intermediary between family and Otologist his ability to differentiate may be a valuable aid to both.

Tenderness over the mastoid antrum at the onset of a middle ear abscess or persisting after spontaneous rupture is usually relieved following the additional drainage provided by paracentesis. However, this same symptom coming on after the ear has been discharging for some days or weeks has a far graver significance.

It is remarkable how many cases of actual Mastoiditis lack this oft quoted cardinal sign. I have opened a number of necrotic mastoids which have never at any time been tender over the mastoid. This is, undoubtedly, explained by a thick cortex externally or an erosion of the inner plate, the pressure being absorbed by the uncovered dura. Pain is a frequent symptom and although usually located over the mastoid may be in the form of a generalized headache or again referred to definite areas. I, recently, operated on a patient with severe pain along the anterior border of the sternomastoid muscle and in the eye of the same side. A large tip cell filled with pus under pressure was found. When dura was uncovered in the zygomatic area pus under pressure escaped there.

Rise in temperature is a valuable aid in determining the onset of a clinical mastoid. Following the opening of the drum fever usually subsides as soon as drainage is thoroughly established. An elevation of temperature after a normal period, other causes being ruled out, should make one suspicious of a mastoid. Also, a temperature which continues high in spite of adequate drainage may indicate a virulent infection and require early intervention.

Probably the most dangerous type of infection that we have is that of the streptococcus mucosus capsulatus. In the clinics of Vienna it is seen daily, but has not been so frequently reported in this country. However, one experience with its complications is sufficient for a lifetime. Its nearly painless onset and scant discharge make it frequently overlooked by both patient and practitioner. The first evidence of its deadly power may be a subperiosteal abscess, a Bezold mastoid or an intracranial complication. There is a dull grayish red appearance to the drum which is characteristic. This drum never returns to normal. Other symptoms are marked loss of hearing and persistent tinnitus. Professor Neumann says that every mucosus capsulatus ear should have a Mastoidectomy.

Every general practitioner has patients come to him for treatment of a chronic foul smelling ear or he may encounter the condition in a routine physical examination. Time does not permit a consideration of the pathology of the

chronic ear but odor from a suppurative ear means bone destruction and this usually involves the mastoid. Before any chronic ear is allowed to follow the regime of drops so prevalent, a careful functional test should be made together with a test for the fistula symptom. Many radical mastoid operations can be averted by the Sulzberger powder treatment, although this treatment may take weeks or months.

Facial nerve paralysis coming on during a chronic ear indicates extensive bone destruction, and requires immediate intervention. Temperature over 100 persisting several days should be viewed with alarm. All too often the ear specialist sees these cases only after some intracranial complication has ensued. Probably there is no pathological condition in the body with as grave possibilities which is given such scant consideration as the chronic ear.

**Octavus Dulaney:** I think the gentlemen who composed this Symposium have certainly given us a very concrete discussion of the subject. Borrowing a phrase used recently by Dr. Virgil Simpson, "The subject has been brought right up to April 18, 1932."

One thing Dr. Bass failed to mention was allergy. In a case in which I was associated with Dr. Bruce, a child about 8 years of age had a decided tendency to recurring colds, bronchitis, asthma, with frequent ear symptoms, at times becoming quite severe. Patient had a number of ear punctures from time to time and comparative comfort would be obtained for a short while. The tonsils and adenoids had been removed without relief. These recurrent symptoms seemed to be more frequent in the winter months. In 1931, Dr. Bruce sent this patient to Memphis to Dr. Henry, who made various tests and found that the child was sensitive to many things, and especially to linters. What we mean by linters is the cotton that is taken off the cotton seeds before they are crushed into oil, and this cotton is used largely in mattresses. Patient was sensitive to the ordinary lint cotton, and had been sleeping on a mattress made of linters; a change was made and she has been relieved almost entirely of all her past ear symptoms. Before this, I have seen her when she had a decided tenderness over the mastoid in conjunction with a bulging and red ear drum. Although this was always relieved quickly by a myringotomy, there is danger of repeated myringotomies, occasionally one is liable to get an infection from the outside.

I recall another case of a lady about 40 years of age, who had similar symptoms caused by allergy, and I am sure that this had something to do with the mastoid infection she later developed and for which she was operated.

**J. Harvey Hester:** I have enjoyed this symposium very much; it was very instructive and beneficial to me.

I am of the same opinion as Dr. Hall; that is,

I believe that careful "history taking" in all of these cases is very important. We gain so much from these histories which helps us in our diagnosis as well as our treatment.

One thing that Dr. Dabney mentioned, also Dr. Hall, as to the important symptoms. Pain and tenderness are two very important symptoms. However, discharge is also an important symptom. A profuse discharge lasting for ten days or two weeks with or without pain, in my opinion, should be carefully investigated. An x-ray should be made to determine whether or not there is any cell destruction; if there is cell destruction, an operation should be done immediately.

As to irrigation: I do not exactly agree with some of our men in regard to irrigation. Irrigation in the hands of an inexperienced person, like one of the family, is very dangerous in my judgment. Too much force may be used, which may cause extension into the mastoid and causes mastoid infection if not already present. I usually advise against irrigation unless a competent nurse is in charge of patient. I never operate upon a case without a previous x-ray examination. Indications for an operation in my opinion are pain, tenderness, discharge, temperature ranging from 100°-102° F. with cell destruction, and then I do not hesitate to go in and do what is necessary. I think one of the most important things is seeing these cases early and do a paracenteses to secure drainage. Drainage is one of the things I try to establish early, through the nose as well as the external ear canal.

**B. F. Zimmerman:** The entire symposium was interesting and instructive; it was one of the best I have heard before this Society. The papers by Doctors Hall and Jelsma should be of particular interest to the profession in general. I agree with Dr. Hall that the diagnosis of intracranial complication is not always easy. This is particularly true in the acute stage where the symptoms of the primary disease so often obscure those of intracranial complication. A lesion entirely extradural may simulate an intradural one, and careful study of the symptoms and their progress is necessary before a differential diagnosis can be arrived at.

The results of treatment from the methods employed by Dr. Jelsma in his cases, are most gratifying. It has been my practice to establish drainage rather than to rely on simple aspiration in cases of brain abscess. I have used the rubber tube and the metal cannula, with I should say average success. In two cases I have used a Mikulicz' drain with prompt recovery.

The results of the treatment for meningitis are very good and it will be interesting to see what the results of a larger series may show. If they are as good as reported in this limited series, a distinct step forward will have been taken.



**Shelton Watkins:** We have been treated with excellent papers. I wish the general physician would enter into the discussion more and, also, ask questions.

In regard to Doctor Bass's paper, there are two or three points I would like to bring out. One is that acute suppurative otitis media sometimes develops at the onset, or just preceding, an acute infectious disease. It is important, I think, to remember this in deciding what type of anaesthetic to give when opening the tympanic membrane and to be on our guard for the exanthemata of childhood, for, when such is the case, a general anaesthetic is to be avoided, if possible. Another point is in regard to incision of the tympanic membrane in cases of acute suppurative otitis media. If the temperature is not high and the symptoms not pronounced, I think we are justified in conservative treatment. Especially is this true in cases secondary to "head colds". Many cases will take care of themselves without incision. Should the patient's condition get worse, incision can be done with very little delay. Of course, when the symptoms are pronounced when first seen, a prompt and free incision should be made and repeated as often as necessary. In infants and small children the temperature sometimes is very high, 104°-105° F. and the child becomes irritable and restless, which may cause one to fear a serious complication, as meningitis. Often a free incision of the tympanic membrane will relieve all of the symptoms within a few hours.

In regard to Doctor Dean's paper, I wish to say that acute mastoiditis can be compared very much to acute appendicitis. Both conditions may be very mild and heal without operation, but in each at times the patient may be carrying a stick of dynamite that may explode. Another similarity is that in each any one symptom may at times be absent. I feel that in a case where there are no alarming symptoms, and the white blood count is not high, it can be watched three or four weeks and even longer without any undue risk. If I had to rely on only one symptom, I would choose the discharge. I feel more can be determined from it than any other symptom alone. I do not think pain alone without aural discharge is, as Doctor Zimmerman has said, an indication of mastoiditis. A number of conditions about the head and throat may cause mastoidalgia and the burden of proof is decidedly upon the one who makes such a diagnosis.

In regard to Doctor Hall's paper, I wish to bring up the point that intracranial complications of otitic origin are frequently multiple, which greatly obscures the picture. In the interpretation of the Queckenstedt test, it should be remembered that it is not positive unless there is a complete blockage of the sinus. There may be a mural thrombus and septic emboli will

be carried all over the body before the Queckenstedt test would become positive.

A few words about the diagnosis of brain abscess. It is most difficult to recognize in the early and latent stages, and in the terminal stage almost anyone can diagnose it. The most reliable symptoms in the early stage are, I believe, a persistent headache, which often goes from the front to the back of the head, and mental and physical fatigue. I would like to ask Doctor Jelsma what he thinks of the King treatment and, request that he compare it to the Dandy treatment of brain abscess, which he advocated.

**J. J. Glaboff:** There are two outstanding reasons for the greater frequency of acquired diseases of the ear in children: (1) the occurrence in childhood of the infectious fevers; (2) the greater frequency of acute infections involving the respiratory tract with the harmful sequelae involving the middle ear and dependent frequently on the presence of adenoids and enlarged tonsils.

The outstanding symptom of an otitis media in an older child is pain in the ear, commonly intermittent and lancinating, with or without tenderness on pressure over the tragus. The outstanding symptom in an infant is great restlessness and intermittent crying out especially when in the recumbent position, and so therefore more at night. Mothers frequently state that they held the baby up in their arms all night as the only means of getting relief. Pain is not a reliable prognostic symptom, per se, except that if it persists in spite of the use of 5 per cent carboglycerine, it means a persistent, usually progressive condition that will probably lead to spontaneous rupture or require paracentesis. Fever is not always a dependable symptom. It is nearly always present to some degree; it may be quite high. In greatly undernourished infants or children fever may not be present.

Otitis media in the hospitalized cases is much more severe and is followed more commonly by grave digestive and nutritional disorders, than is otitis media in private practice in the home. The explanation for this is that nearly 90 per cent of the hospitalized patients are in a dystrophic or athreptic state on admission. The constant recumbent position of the hospitalized infant favors the gravitation of infected material from the throat to the middle ear and the mastoid. The otitis media in these cases is almost symptomless. Sometimes a subnormal temperature is present. Vomiting and diarrhea are frequent symptoms of the condition and lead to serious dehydration.

Facial paralysis is rare in acute otitis media; it occurs more frequently in chronic otorrhea, in which it always leads to a well founded suspicion of tuberculosis etiology. Nystagmus and

involvement of the sixth or seventh nerve call for serious consultation.

As regards relationship between otitis media and gastro-intestinal tract infection, there is much debate. One side states that the gastro-intestinal infection is secondary to the otitis media; the other side states that the otitis media is concomitant with the gastro-intestinal infection, and has no relationship with it. From a review of literature, evidence favors the view that the otitic condition is not the etiological factor responsible for the intestinal intoxication.

Symptoms of concealed purulent otitis media are more fulminating in the young nursing than in the older child. The fever is usually very high. Gladys H. Dodd in "Archives Disease of Children," Feb., 1931, Edition, reported a case of otitis media with purulent meningitis in an infant nine days of age. The infant appeared normal for the first five days of life. On the sixth day there was a slight elevation of temperature, but the infant nursed well. The next two days the temperature rose moderately and respirations became Cheyne-Stokes in type. The baby died on the ninth day of life. There had been no discharge from the ears at any time. Post-mortem examination was essentially negative, except for the brain and the left middle ear. There was a considerable amount of pus on all the surfaces of the cerebral hemisphere. The left middle ear and surrounding bones were soft and filled with greenish pus.

In considering obscure septic conditions in infancy, lateral sinus thrombosis, complicating mastoiditis may be overlooked as a possibility on account of its great infrequency and lack of definite clinical symptoms. Klein and Lederer, in Nov., 1930, issue of American Journal Diseases of Children reported a case of lateral sinus thrombosis complicating masked mastoiditis with secondary subarachnoid hemorrhage in an infant 7 weeks of age with autopsy observations. In this case the ears were normal.

From a study of children in a public institution for the deaf, it was found that deafness was acquired in 2014 of the 5438 children examined, and that infectious fevers played an important part in the production of these acquired defects. Meningitis headed the list, next measles, scarlet fever, and influenza.

**Karl N. Victor:** I want to mention one thing that Dr. Dabney dwelled upon; that is the matter of irrigation. If not done properly, more harm is done than good. There is certainly a great deal of harm to be done by forceful irrigation. I, myself, use the following method at my office:

I take a round-tipped medicine dropper filled with peroxide, and hold it midway in the canal, drawing the solution back and forth into the dropper and repeating this procedure until the solution returns clear, and then use 60 per cent alcohol or mercurochrome in a similar way.

This keeps the canal clean, stops gumming of the discharge and allows for free drainage, as well as being definitely antiseptic.

For home irrigation, I advise the use of an aseptic ear syringe of 1-8 ounce size. The rubber tip on this syringe prevents its being inserted too far into the canal, and the relatively small size of the bulb prevents too much force being used. Also, mild suction may be obtained with this instrument, when indicated. Any of the various antiseptic solutions may be used for irrigating purposes, although I prefer a warm solution of boric acid.

**Henry C. Hermann:** The x-ray diagnosis in mastoiditis is practically synonymous with an osteomyelitis, and in the early stage of mastoiditis you may get an x-ray that is absolutely negative; yet after the bone changes have progressed into mastoiditis you usually get bone destruction of the cells in that mastoid. And, since the opposite mastoid is symmetrical, you have a comparative. The rule is that if you do not find destruction in the mastoid cells and your patient's symptoms and clinical signs point to a mastoiditis, it is advisable to re-x-ray as a check on the first x-ray.

**W. E. Gardner:** This whole symposium and the discussion of the papers, has been most interesting and instructive; but I was particularly interested in Dr. Jelsma's report of the use of large quantities of fluid by mouth in the treatment of cases of septic meningitis by lumbar drainage, or laminectomy. I know that he and Dr. Spurling have, for some time, advocated giving as much as 5000 c.c. of fluids daily, stating that it was their belief that in this way the drainage of the spinal fluid was not any better maintained but that there was a flushing out of the whole cerebro-spinal fluid pathways.

The thought has frequently occurred to me that, if this latter contention were true, there should be a corresponding decrease in the urinary output, assuming that any appreciable amount of the ingested fluid would be absorbed, or utilized, and excreted by the spinal drainage.

I would like to ask Dr. Jelsma, in closing, to state if there has been an accurate estimation of fluid intake and urinary output in such cases sufficient to indicate that the excessive intake does really increase the amount of spinal fluid, or does it, after all, only act by increasing the resistance of the host and the prevention of acidosis, as in other general surgical conditions.

**A. L. Bass** (in closing): I enjoyed the other papers, and the discussions brought out important points without any overlapping.

As to mastoid development, we have the pneumatic and the diploetic types; in the pneumatic, the cells are the large ones extending from the antrum, and the diploetic cells are smaller. If x-ray picture shows the pneumatic type, you know that the patient has a better chance to throw off the infection because those



cells are large and consequently more likely to drain; whereas, in the diploetic type, the cells being small, the mucous membrane becomes swollen and the infection cannot drain, which renders the patient more liable to mastoid drainage. I show patient how to irrigate the ear canal in most instances; because if they do not irrigate it properly, they are apt to do more harm than good,—they can use too much force, as well as too little. Moderate pressure should be used, pulling the auricle up and back, with just enough force to clean out the canal in order to get heat too. At first, I have patient use warm, normal saline because it cuts the blood better and keeps clot from forming and closing up the incision. Then, after a few days I have them switch to warm, boric acid solution, teaspoon to pint, because this has a little more antiseptic value. Then if the patient is one who is not very aseptic, or if discharge is persistent after two or three weeks, I use 1-5000 bichloride of mercury solution. Where the discharge is slight, I use a cotton wick in the canal, according to Pratt's method, changing it anywhere from two to four times a day, according to amount of discharge.

The best way to culture a middle ear infection, is at the time of incision; because after ear starts draining, or drum is already ruptured, you are not as certain to get the true organism which is causing the trouble. *Streptococcus mucosus capsulatus*, which is the *pneumococcus* Type III, is about the most virulent organism, yet is a very quiet worker—causing practically little or no pain or temperature. Many very good men, some internationally known as mentioned by Dr. Pryor, believe in opening and draining the mastoid as soon as the organism is discovered; but, personally I had rather wait a while so as to give nature a chance to wall off the infection and allow it to become localized, and then one is not so liable to get such a severe reaction when operating.

Regarding sinus thrombosis; it is the early cases that do not have an occlusion of the sinus. What we want to do is to obliterate the sinus and keep the infection from feeding the general circulation. Infection gets into the sinuses by one or two ways; that is, necrosis of neighboring, infected mastoid cells producing a perisinusitis, or from thrombo-phlebitis of a vein which drains into the sinus. I read an interesting article in the Archives not long ago, entitled "Why Ligate the Internal Jugular?" There were three methods mentioned: (1) opening the sinus, then ligating the internal jugular; (2) ligating the internal jugular, then opening the sinus; (3) obliterating the sinus only. The percentage of mortality of all three methods was practically the same—there being about one per cent difference in the three.

Dr. Dabney asked about when to operate. I like to wait three or four weeks and give na-

ture a chance to wall off the infection and patient an opportunity to get well, then when you do operate the convalescence is much quicker than from early interference.

Regarding Gradenigo's syndrome, which is a localized meningitis at the petrous tip, always associated with paralysis of the external rectus, temporal pain and middle ear involvement of the side affected. Most of these patients need mastoid drainage, but not all.

With reference to gastro-intestinal disturbance, complicating otitis media. The St. Louis physicians have gotten quite a reputation for doing too much mastoid work relative to complicating gastro-intestinal upset,—more than they deserve. I have talked to a few of them and they do not believe in opening the mastoid unless there is some evidence of infection.

One thing that is noticeable about this meeting, is that Dr. Simpson did not enter into the discussion.

**Walter Dean** (in closing): I have edited my voluble discussion to a few remarks about myringotomy. The best aid we can offer nature to prevent or combat mastoiditis is to do very early myringotomy. Properly opening the drum early has never impaired hearing but is our best method to conserve hearing. Secondly, it allows the causative bacteria to be swept outside the ear before they multiply and re-multiply; before they dig deeply into the submucosa of the middle ear causing inflammatory oedema which often mechanically blocks and defeats tardy myringotomy. Thirdly, if prompt exit is established through the drum (and Eustachian tube) there will be little or less tendency for the suppurative exudate to be dammed back into the mastoid cells. Fourthly, when the mastoid is already infected, pressure stasis with deep burrowing in of the invading bacteria will be relieved or partially relieved. In other words the pathogenesis is as mechanical as it is biolytic. This is particularly true in infants whose drums are at least ten times as thick as they will be in adolescence. The corollary is that infant's drums are difficult to interpret and very slow to perforate spontaneously. If we as students of medicine cannot anticipate nature, we have no function at all.

**Gaylord C. Hall** (in closing): I enjoyed the other papers very much and want to thank the gentlemen for their discussions as well as thank those who listened.

**Franklin Jelsma** (in closing): There are various methods employed to establish continuous drainage of chronic abscesses. Dr. Watkins inquired concerning the simple aspiration method and the King wire basket. Both of the above procedures have their indications. No one method should be used in all cases. Each abscess must be carefully considered. The procedure selected must depend upon the size, location and depth of the abscess, as well as its chronicity,

and the general condition of the patient.

In regard to Dr. Gardner's question concerning the production of cerebro-spinal fluid when continuous drainage has been effected: We have accurately measured the spinal fluid as it drained after continuous drainage had been established by laminectomy and have found that with the spinal fluid pressure reduced—as caused by drainage of the fluid—there is a marked increase in spinal fluid output. Also, that an increase of fluid intake will cause an increase of spinal fluid flow from the drainage wound.

### THE BOHLER METHOD IN THE TREATMENT OF FRACTURES\*

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I am prompted to write this paper on the Bohler method in the treatment of fractures because I spent several weeks in Dr. Bohler's Clinic in Vienna last summer, and the ease with which he handled complicated fractures and the wonderful end results he obtained was marvelous to me.

I am not claiming any originality for this paper as it is taken almost literally from Dr. Bohler's book on the treatment of fractures which he kindly presented to me while in Vienna, and from personal observations made while a student in his Clinic. It will be impossible in this paper to go into Bohler methods of treating special fractures, but we will have to deal with fractures in general, with particular emphasis on the unpadded cast which Dr. Bohler has made so popular both in this country and in Europe.

In the treatment of every fracture there are three fundamental rules which must be adhered to: (1) The peripheral fragment must always be placed in the direction where the central one points; (2) Every fracture must be reduced by means of traction and counter-traction; (3) After the reduction the fragments must be left continuously in the right position until firm union takes place.

There are different ways of applying these rules, and the result obtained is nearly always favorable if they are strictly carried out.

The first fundamental law sounds very simple, but is frequently not adhered to because the exact position of the fragments is either not known or only insufficiently understood.

The original dislocation of the fragments is produced by the force fracturing the bone. It is, however, by muscular action that the dislocations are continued and assume their

typical forms. The law of gravity also plays an important role here. The longitudinal displacement is naturally a shortening which is caused by the muscle running along over both fragments. Every shortening with a longitudinal displacement brings about a lateral dislocation, which is easily understood, since the fragments can never glide one along the other unless a shortening took place. The various rotations and the displacements in the axis are produced only in a small part by the muscles passing over the fragments. These deformities are in a greater measure due to the attachment of the muscles to the shorter fragment near the joint.

The second fundamental rule, which consists of the reduction of the displaced fragments by means of extension and counter-extension, is generally known. Such a pull can be made either by the hands or some mechanical apparatus, but for the continuous effort we need weight extension. It is important to add that extension and counter-extension, as for instance, in the correction of typical fractures of the radius, should be discontinued only when the cast has hardened.

Longitudinal traction is necessary for the correction of every fracture with displacement, because only in this manner can shortening be reduced. The angular deformities always disappear when the distal fragment is placed in the direction towards which the proximal one points. The correction of the lateral displacement is only possible after the shortening has been reduced. After the shortening disappears the lateral displacement disappears either of its own accord or by means of lateral pressure.

As an illustration of what has been mentioned, I have a few drawings of a fracture of the upper end of the humerus which will bring out some of the points I want to make.

The third fundamental rule consists in the continuous immobilization of the properly reduced fragments until firm union has taken place. This, however, is most frequently not adhered to because many surgeons fear the stiffening of the joints in consequence of a long-continued fixation. One is only able to follow this rule intelligently if one knows when the fracture is sufficiently solid. It seems, however, that the opinions regarding this matter are faulty (Bohler). In general, the time allowed for fixation is far too short. For the fracture of the forearm only three or four weeks of fixation are advised. According to Bohler transverse fractures in the middle of the radius rarely heal before eight weeks, and often much longer time is required. Transverse fractures in the middle third of the tibia are never solid in six weeks, but require ten weeks and frequently more.

\*Read before the Third District Medical Society at Bowling Green.



Functional treatment of fractures has for its object the capacity to use the limb, and as soon as possible. The dreaded consequences of every fracture are shortening and other deformities, also the stiffening of joints, atrophy of muscles, etc. The shortening and other deformities can be avoided if we adhere strictly to the rules given, and hold the properly reduced fragment in good position until firm union takes place.

While the reduction of some recent fractures is relatively easy, it is often difficult to keep them continuously in the proper position. A good result cannot be obtained if we use one method of treatment, such as plaster cast, a splint or extension, or only massage.

The kind and the location of the fracture, the constitution and age of the injured person, as well as the facilities for treatment are factors which must be taken into consideration. Good results can be obtained with every method of treatment provided it is correctly applied.

By functional treatment we understand the complete, uninterrupted fixation of the fragments in good position with the simultaneous active movement of all the joints, or as many as possible, and with the avoidance of any pain. The fulfillment of these depends on the technique of bandaging and the type of immobilization. If the fragments are dislocated and at the same time the joints partially or entirely luxated, it is important first of all to bring about an exact reduction and then use a proper support to immobilize the bony fragments until union takes place. Whether we use wooden or metal splints, a plaster cast, or an extension dressing is quite unimportant. It is only important that the method used for the immobilization be reliable and durable and that it not be removed too soon. The best, the most convenient and inexpensive material for this use is plaster of Paris, which can be used in many of the various fractures.

Many text books warn against the indiscriminate use of a plaster of Paris cast because of the danger of stiffness of the joint and the atrophy of muscles. This mild warning is directed against the padded cast. Particularly forbidden is the non-padded circular cast, because of the danger of pressure sores and especially of serious disturbances in the circulation with resulting ischemia, muscle contractions, and gangrene. These dangers are actually present if a circular plaster of Paris bandage is used, but by using an adequate technique and keeping a strict watch on the patient in the first few days, all these dangers can be avoided. The padded plaster cast should only be used to transport the patient, but not for treatment, because the frag-

ments are easily displaced. The padding cannot be uniformly placed under the cast, and after a time it is displaced. Pressure sores are often seen under padded casts where there are uneven, bulging areas in the skeleton. If, on the other hand, a non-padded cast is carefully applied, the pressure is evenly distributed over the whole surface of the enclosed extremity. Before the non-padded cast is applied it is important to press away the hematoma and the swelling. It is also important not to change the position in any way after the plaster is applied. First a plaster splint is applied and then surrounded by circular turns. This bandage is actually not a circular cast in the old sense. The plaster bandage should not be tightly pulled, but only lightly thrown around. For certain fractures, as, for instance, for Colles fractures, a dorsal plaster splint alone is sufficient. The plaster must be applied avoiding every fold, and when molding near a joint is necessary, the pressure must not be applied on any limited area, but uniformly with the flat of the whole hand. To do this takes practice and experience.

The skin should not be shaved nor covered with grease before the plaster is applied. In this way the plaster becomes uniformly incorporated with the hair and holds better. Because the pull on the hair is uniform the patient feels no pain. Swellings which take place after the application of the cast can be relieved by raising the upper extremity on an aeroplane splint and the lower extremity on a Braun's. In the first twenty-four hours the fingers and the toes must be repeatedly and carefully examined. This is particularly important in those cases which have been bandaged immediately after the injury and before the swelling has had time to appear. If the fingers or toes become very much swollen and bluish or cold and various sensations are either disturbed or disappear altogether, the bandage must be split open. If the bandage is not removed at the proper time the pain disappears in about one or two days; this indicates that the death of the extremity has taken place. The bandage should never be left closed in the interest of a good position of the fragments when danger to the viability is present. Every patient who is sent home with a non-padded cast should be instructed to return at once if he begins to suffer any pain. This applies not only to the plaster cast, but to all other forms of splints and bandages.

#### THE METHODS OF ANALGESIA.

Every fracture is painful and the pain is aggravated by the least movement. The patient contracts his muscles reflexly in order to avoid the pain, and therefore aggravates

the displacement. The muscular spasm is particularly great, often insurmountable, when the extremity is being pulled in the attempts at reduction. This pain can be alleviated either by general anaesthesia or by local or regional analgesia. In all recent fractures the Bohler Clinie uses local analgesia, and only in isolated cases regional analgesia, but never general anaesthesia. Bohler reports more than 3,000 cases of local analgesia without the slightest injury, whether in the form of an infection or an intoxication. The method of local analgesia is extremely simple in recent fractures. In the usual manner of infiltration anesthesia, such as in operating for inguinal hernia, we must infiltrate all of the tissues. In a recent fracture the circumstances are quite different since a hematoma is present which penetrates all of the tissues in the vicinity of the broken fragments. It is sufficient to introduce the needle down to the broken fragments and to inject the solution, which is at once diffused in the hematoma. The anesthesia takes place immediately, and as a result, muscular relaxation. Ten to fifteen c. c. of 2 per cent novocaine solution are injected in the average case.

If the fracture is a few days old and the hematoma is in the process of organization it is impossible to inject directly into the hematoma with success. In such cases you must inject the whole circumference of the bone.

Spiral anaesthesia is employed in difficult fractures and dislocations of the pelvis with rupture of the bladder, etc. Brachial anaesthesia is used on some fractures and dislocations which are not easily corrected under local or regional.

#### TREATMENT OF FRESH COMPOUND FRACTURES

When the skin and other soft parts are so injured that the fragments communicate with the outside of the body, the fracture is spoken of as open or compound. If only blood escapes from the wound we have to deal, as a rule, only with an open injury to the soft parts. If, however, drops of fat are seen to float in the blood, they originate from the bone marrow, and the fracture therefore is a compound one. Bacteria are now able to penetrate into the depths and cause an infection of the torn soft parts, the bone, and bone marrow. If the skin is again closed in the first six to eight hours after the accident this danger can be largely avoided. The wound area is rendered free from pain by the use of local or regional anaesthesia. All crushed and soiled tissues are excised. The hemostasis must be perfect. The danger of infection is greater in fractures from direct force than those from indirect force. In fractures from

indirect force the skin is torn through or punctured by fragments from the inside and is, therefore, relatively little damaged. On the other hand, in fractures from direct force, the skin is generally badly crushed, and dirt and other foreign bodies are introduced into the wound by the violent force. The wound must, therefore, be enlarged in order to obtain a good view of the whole injured area. All crushed edges of the skin and likewise all soiled tissues, such as fat-fascia and muscles must be sharply excised and removed. Soiled parts of the bone are also removed. Clean bone splinters are not removed in order to avoid the danger of pseudarthrosis. After the wound appears quite clean it is sponged with tincture of iodine, but only the skin and not the other soft parts. It is now closed by closely placed interrupted sutures. Drainage is absolutely avoided.

If an open fracture is seen with high fever, or it is more than twelve hours old, the wound should not be excised and the skin should not be closed. In these cases provision must be made for adequate drainage, especially in those locations where there are thick muscles surrounding the bone, such as the femur. A good and careful reduction of the fragments is particularly important in these cases because large cavities which lie between displaced fragments and which are apt to give rise to abscess formation disappear after the reduction. The complete and uninterrupted immobilization of the well-reduced fragments is, in these cases, especially important. The wound needs, for healing, the same condition that any living or plant organism needs for growth. These are: light, air, time, rest, heat, and moisture. The more rest is given a wound the shorter time is needed for healing. Moisture and heat are furnished to the wound by the circulating blood. The open treatment of wounds has various advantages—its biggest advantage lies in the fact that if the form of treatment is properly carried out the wound is never disturbed.

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#### Radiology in Treatment of Cancer of Larynx.

—According to Chochia, the predominant types of cancer of the larynx are basal cell, prickle cell and occasionally adenocarcinomas. Surgical treatment consists in radical excision of the cancer and the metastases in the lymph nodes. When the tumor has spread to the vocal cords, the ventricles and the cartilages, total extirpation of the larynx is indicated. This results in death in 50 per cent of the cases and with but few exceptions recurrence in the rest. The latter intervention and the results are so serious that few patients consent to the operation.



THE MECHANISM AND TREATMENT  
OF HEART FAILURE\*

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Heart failure is usually the result of organic heart disease, and although etiology and physical signs serve to separate heart disease into many different types, the signs and symptoms of heart failure from every form of heart disease have much similarity.

The three main groups of heart disease are composed of those following rheumatic fever occurring in early life, of those caused by syphilis affecting patients usually in middle life and of those of arterio-sclerotic origin, manifesting themselves usually after the prime of life is past. These three groups of cases have their characteristic lesions and physical signs, the first showing its most conspicuous changes in the mitral valve, the second usually being characterized by changes in the aortic valves and in the aorta adjacent to the valves, and the third revealing itself by myocardiac changes leading to cardiac enlargement.

When however, the heart begins to fail from any cause or from any type of lesion certain common and well known signs and symptoms appear, not in the heart itself but in other organs. Dyspnoea, edema or dependent parts, evidence of congestion of various organs, and collections of fluid in serous cavities, especially in the right side of the chest appear, and the condition commonly called cardiac decompensation manifests itself. These are the signs of heart failure. They indicate not that the heart is diseased or damaged, but they indicate that the various factors of safety by which a lesion in the heart may be compensated by unusual activity of another part of the circulatory system have been exceeded. Heart damage up to a certain point is always compensated, but beyond a certain point, when the demand exceeds the combined ability of the body to meet it, decompensation or heart failure sets in. It is then that treatment is demanded and it is then that the patient with heart disease present the common signs and symptoms that usually bring them to the physician. Although it is the disturbances of the circulation that are responsible for the production of heart failure, regardless of the cause, with which this paper deals especially, it may be well to pause briefly to consider the problems that have to do with the prevention of the distressing situation of cardiac failure.

The first line of attack is naturally against

those three great causes of chronic heart disease, rheumatic fever, syphilis and arterio-sclerosis. The diminution of these three diseases represent a major and most difficult problem in public health, but that it is a true problem in public health cannot be denied when one realizes that there are approximately two million persons in this country alone with chronic heart disease.

The second line of attack is the prevention of heart failure in persons with heart disease. Here again difficulties beset the physician, as so many persons do not seek medical aid until the symptoms of heart failure appear. And even after heart disease is discovered, the exact restrictions of the individual within the limits of safety, and yet allowing reasonable freedom, is difficult to determine. The prevention of heart-failure in persons with heart disease is a sound reason for the desirability of periodic health examinations, a procedure in which everyone believes more or less and which so few practice.

These two great phases in the study of heart disease are mentioned to emphasize the fact that in considering the third great problem, that of heart failure, they may not be lost sight of, and to define perhaps more closely the subject being considered specifically in this paper.

The study of heart failure is not a study of the heart alone, it is the study of the relation of the heart to the blood vessels, to respiration, to the whole great system that has for its function the supply of oxygen to every living functioning cell of the human body. The greatest single idea that has ever been expressed regarding the circulation and its disturbances was that given to the world in a wonderful little volume published in 1628 by the immortal William Harvey. He first conceived the principle that the blood moves in a circle, and he presented numerous and ingenious arguments for the truth of this idea, in spite of the fact that the capillaries at that time had not been discovered, and the complete mechanism that could make this motion of the blood possible was unknown. And yet today the conception of heart failure must go back to the idea of Harvey and it must rest on the disturbance of the motion of the blood in a circle as he understood it for its true explanation. Since the time of Harvey it has been known that the blood moves as it were in two circles, and that the heart is the chief propelling power throughout the whole vascular system. It is well known that the blood starting in the right ventricle is forced through the lungs, where its truly marvelous constituent, hemoglobin, gives up its carbon-dioxide and in its place takes on its load of oxygen, and when properly laden goes on

\*Read before the Third District Medical Society, at Franklin.

to the left ventricle to be propelled into millions of capillaries where the essential oxygen is liberated to the cells of the tissues. Here too the waste products are gathered up and carried away as the blood returns again to the right ventricle, and are discharged through the lungs or kidneys or changed by other organs. When one considers this great cardio-vascular-respiratory system, and how it is in reality the essential mechanism of existence, one must realize the many factors that operate in harmony and in perfect coordination in order to maintain man in a state of being known as health. It is not difficult also to realize in how many ways circulatory failure may be produced.

The particular type of disturbance of the circulation to which we are today directing your attention is however that which results from heart disease. Of all the functional activities the coordination of which is essential for the proper maintenance of the circulation, a perfect balance between the work done by two ventricles of the heart must take first place. If the right ventricle pumped with each beat even a few drops more than the left ventricle, in a short time, measured in hours or even minutes, the circulation would be entirely thrown out of commission, as there would soon be more blood in the lungs than in the systemic circulation. And yet it has been shown by Piper that normally the two ventricles are so adjusted that the left ventricle does constantly from four to five times as much work as the right. Modern physiology, led especially by Starling, has demonstrated the remarkable ability possessed by the healthy heart to maintain this essentially important balance between the two ventricles.

This balance too is maintained in spite of damaged valves or diseased muscle or improper blood supply to the heart muscle, so long as persons with heart disease do not show the signs or symptoms of heart failure. On the other hand, it is our belief that as soon as there is a disturbance of the relative power of the two ventricles, then heart failure shows itself. The idea that heart failure is the result of a lack of perfect balance between the right and left ventricles is neither new nor without experimental support, but it has been neglected especially in this country as an important factor in the production of heart failure in cardiac patients. As long ago as 1878, Dr. William H. Welch showed that generalized pulmonary edema, one of the most striking features of heart failure, occurred in animals after mechanical damage to the left ventricle, and he considered the relative weakness of the left ventricle as compared to the right as the cause of the pulmonary edema.

It would be very remarkable, with the various disturbances that take place in the muscle, valves and blood supply of the heart if the two ventricles were always equally affected and when weakening of the cardiac power occurred that it should not involve one ventricle more than another.

Clinical studies of patients with heart failure indicate that a distinction can be made regarding the relative weakness of the two ventricles.

In our study of patients we are able to distinguish cases in which the left side of the heart is inefficient relative to the right side of the heart, from those in which the right side of the heart is relatively inefficient. While this distinction cannot be made with certainty in all cases, some cases show a disturbance in the pulmonary circulation out of all proportion to the disturbances in the systemic circulation. These cases are suffering, we believe, from relative failure of the left ventricle, which is unable to handle properly the blood sent to it by the right ventricle. Other cases show edema of the extremities and congestion of the abdominal viscera while the pulmonary circulation shows no evidence of being disturbed. In such cases the right ventricle is relatively inefficient, and is unable to receive and propel all the blood sent to it by the left ventricle. In many cases the disturbance of coordination between the two ventricles affects both the greater and the lesser circulations, so that both show evidence of heart failure.

We have recently studied a patient who had great enlargement and pulsation of the liver, with marked peripheral edema and whose heart gave the physical signs of a tricuspid insufficiency. At the same time, the patient had no evidence of moisture in the lungs, almost no dyspnoea, and was able to lie flat in bed. This patient was considered to have failure of the right ventricle as the blood seemed to be dammed up in the systemic circulation, indicating that the right ventricle was unable to care for the blood sent to it through the systemic circulation by the left ventricle. At autopsy there was seen a great difference in the two ventricles, the left having a much thickened, hypertrophied wall, while the right was greatly thinned, contained much fibrous tissue, was markedly dilated and showed a definite tricuspid insufficiency.

The general idea regarding heart failure seems to be that the heart no longer supplies the amount of blood actually needed by the body. No doubt there are such cases, and they may be seen in diphtheria, in the later stages of pneumonia, in surgical shock and after occlusion of a coronary artery. But we believe that this is not the essential mechan-



ism in the type of heart failure that occurs in chronic heart disease. In fact there is some direct evidence, especially in the work of Eppinger, von Papp and Schwartz that the out-put of the heart is actually increased in heart failure, although there is other evidence furnished by the work of Blumgart and of Lundsgaard that the circulation is slowed and the out-put of the heart diminished in heart failure. This point has not as yet been definitely settled.

It is our belief that an increased cardiac out-put, such as must take place with exercise, favors the lack of balance between the two ventricles, and it is of course common knowledge that measures diminishing cardiac out-put, tend to relieve heart failure. There is some indirect but important evidence in favor of this view that has come out of recent actual measurements of the out-put of the heart in healthy men and in animals. For instance, Bock and his associates have shown that the output of the heart per minute is generally less in individuals in the sitting position than when lying down, and this may be taken as the reason why most patients with heart failure prefer to sit up, as this position tends to diminish the cardiac out-put.

Another important work bearing on this subject is that done recently in our department by Harrison and Leonard. They showed conclusively that digitalis administered to normal dogs in doses comparable to those given to patients actually caused a diminution of the cardiac out-put per minute, averaging about twenty-five per cent less than before the drug was given. Burwell, Neighbors and Regen also working in our department have found that the drug has the same effect on normal men. As yet, no methods are satisfactory for measuring the out-put of the heart in patients suffering from heart failure, but it seems probable that the action of the drug is the same in such patients as on normal men and animals. If this is the case it may be said that digitalis produces its remarkably beneficial effects in heart failure when the heart is beating regularly, not by increasing the out-put of the heart, as has been generally believed, but by actually diminishing its out-put. If this is the case, as we believe it to be, the beneficial results are produced by affecting the heart in such a way as to allow the balance to be restored between the two ventricles, and thus overcoming a very important factor in the production of heart failure.

It is our opinion that the greater the out-put of the heart, the more likely is a lack of balance between the two ventricles to occur.

In closing we wish to state briefly our ideas regarding the mechanism of heart failure and

the general principles of its management without advancing at this time further reasons for some of the ideas here expressed.

The most potent factor in the production of chronic heart failure is a disturbance of the perfect balance normally existing between the action of the right and left ventricles of the heart.

This lack of balance occurs more readily when the out-put of the heart is increased, and it may occur and persist in diseased hearts without excessive cardiac out-put.

The presence of this lack of balance may continue with reduced cardiac out-put in diseased hearts, but procedures and drugs that cause a decrease in the cardiac out-put tend to restore the balance between the two ventricles and thereby relieve heart failure.

The lower the level of cardiac output per minute at which a lack of ventricular balance occurs, the severer the type of cardiac failure, and the worse is the prognosis.

It is essential to distinguish acute heart failure accompanied by diminished cardiac power from chronic cardiac failure resulting from incoordination of the heart, in order to direct properly the management of the two conditions.

The foregoing conclusions are based on both clinical and experimental studies which are at present incomplete. They are therefore in part hypothetical, and are recommended as a point of view in the study and understanding of heart disease, rather than as firmly established facts.

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**Roentgen Picture of Normal and Pathologic Sella Turcica.**—Scheuermann examined roentgenograms of the cranium of 391 patients with a normal sella turcica and of 55 with brain conditions showing pathologic changes, and made comparative examinations of specimens of normal sella turcicas from 100 patients and of sella turcicas from forty-one with intracranial disorders. The technic in roentgen examination of the cranium, normal anatomy and roentgen pictures of sella turcica, position of the head in certain tumors of the brain, and primary and secondary enlargement of the sella turcica are discussed. There has been close agreement between the results of roentgen examination and of necropsy. The roentgenologist, he says, is to express himself concerning the pathologic changes revealed but to speak with reservation concerning the possible primary or secondary nature of the changes.

## THE THERAPEUTICS OF DIGITALIS\*

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A medical paper is most valuable to the one who writes it. It leads him to review his knowledge, to search out what may be new, and to put down his information in a more or less logical order. For these reasons every doctor should write papers, even though the delivery of them may seem an infliction upon his hearers. A paper, however, can scarcely be so poor that it may not set the hearer to thinking. To the audience the paper may be valuable by bringing new matter, equally or more valuable, as a review of the old, or most valuable, if it serves as a basis of discussion of the subject by the members of the society. In choosing digitalis for my subject, I can not expect to bring new information to this body of practitioners. There has been in recent years a vast literature upon that drug. My hope is that by giving a brief summary of some of this literature to bring from you a comparison of observations and experiences in the practical use of the drug.

Digitalis is one of the most interesting and most useful of our drugs. Long used empirically, its physiological action has been rather definitely settled by experiments upon animals and instrumental observations on man, the laboratory very closely confirming clinical observation. It is a drug having very definite indications for its use and its proper administration followed by very definite effects.

**Physiological Action.** Digitalis by stimulating the vagus center in the medulla slows the heart in one of two ways, first the rate of the whole heart is reduced by depression of the rate of impulse formation in the sinus, or second, the rate of the ventricles is reduced through depression of auriculo-ventricular conduction to a degree to cause partial or complete block (Eggleson *Journal of Medical Sciences*, November, 1920.) There is also good evidence from laboratory and clinic that digitalis acts directly upon the heart muscle although the exact nature of this effect is not known. There are many cases in which digitalis is effective in restoring the failing heart although it does not alter its rate, by direct action probably upon the musculature. It is now generally agreed that digitalis in therapeutic doses does not raise the blood pressure except in cases in which it is already low, in which it is raised by the improved action of the heart. High blood pressure is therefore not a contraindication to its use. In normal subjects digitalis is not diuretic. Its diuretic

action is from its effect upon the circulation, and is manifested in cases having edema with feeble cardiac power.

**Indications.** Broadly speaking digitalis is needed when the patient has the symptoms and signs of failing compensation. These signs and symptoms are breathlessness, cough, cyanosis, edema, pain, weakness, nausea, vomiting, enlargement of the liver, scanty urine, rapid pulse. There is general agreement that the specific effect of digitalis is most certainly obtained in cases of auricular fibrillation and auricular flutter. The drug by its inhibitory action upon the bundle of His blocks some of the excessive stimuli, slowing the ventricle, and making the heart's action both stronger and more regular. This condition (auricular fibrillation) is recognized clinically by the totally irregular action, marked rapidity of pulse, and failure of many contractions to reach the radial artery—of course most certainly diagnosed by the polygraph or electrocardiograph, although fortunately for the general practitioner the diagnosis can usually be made by physical examination. Other conditions are cases of chronic myocarditis, with or without valvular disease, when signs of failure in efficiency of the myocardium develop. Valvular disease is not an indication for digitalis unless the myocardium is unequal to keeping up an efficient circulation—in which case it is to be used irrespective of the valve involved. The most striking effect is in the decompensation of mitral disease, especially in the cases of rheumatic origin. In paroxysmal tachycardia it is ineffective. However, Hatcher and Eggleston approve its use in prolonged attacks if the heart is becoming weak. In partial heart block the drug is distinctly contra-indicated because of the danger of its producing complete heart block. Mackenzie, Wenckebach and others recommend it to strengthen the heart muscle to combat ventricular failure in complete block. This seeming contradiction is explained by the fact that digitalis blocking of the contraction is possible as long as the bundle can transmit impulses, as in partial block, while in complete block the power of transmission is entirely lost. In acute heart failure prompt employment in full therapeutic doses is usually indicated. In a report published in the *Journal of the American Medical Association*, August 16, 1924, by the Council of Pharmacy, caution is advised in treating acute heart failure, since if it should be due to coronary obstruction, digitalis would be distinctly contra-indicated.

**Pneumonia.** For several years there has been much discussion as to the use of digitalis in pneumonia, and its employment in that disease has become a routine measure

\*Read before the Campbell-Kenton Medical Society, Feb. 1, 1926.



with many practitioners. As to its administration, I can not do better than to quote from the Practical Medical Series, 1925, p. 479, a portion of an article by Brooks (New York State Journal of Medicine, April 18, 1924). The Editor remarks in parenthesis, "I have never seen a better statement of the proper way to use digitalis in pneumonia." "Digitalis is very useful, but not in young children. It is very effective when the heart is known to have been previously diseased or incapacitated, as by an old valvular lesion, or when early signs of cardiac embarrassment appear. Rapid methods of digitalization, either hypodermically with digifoline or a tested digaline, or the tincture by mouth are indicated, giving one to two drachms (tincture) per twelve hours until the pulse and heart tones begin to show characteristics of therapeutic digitalization. In other cases which exhibit no preliminary evidence of cardiac defect, if the patient be young and previously in good health, digitalis is not given until it is indicated by arrhythmia, defect in heart tone, pulse volume, onset of edema, or other definite evidence of waning circulation. In practically all cases beyond middle life, digitalis is started in moderate dosage as soon as the diagnosis of pneumonia is made. In these instances, or in young persons who show a defective circulatory force, as low blood pressure, the dose is increased until the apparent defect is corrected, when the drug is either diminished or eliminated until some definite indication for its resumption occurs, when a considerable dose is promptly given, either hypodermically or intravenously. The tincture is given when an immediate effect is not imperative. It can be given in large doses. Digitalis poisoning is rare in these cases, and it rarely does harm. It is the most important drug in the therapy of pneumonia." It used to be the teaching that in pneumonia, and fevers in general, the patient did not respond to digitalis therapy. That opinion was founded upon the fact that the dosage was usually insufficient. It is true, however, that in the absence of arrhythmia the response is slow and less marked in fevers.

Administration and dosage. Digitalis is one of the drugs in which care in selecting a potent preparation is necessary. The progress of pharmacy has brought great improvement in the quality of preparations upon the market—preparations which have been carefully standardized by physiological methods. Many practitioners prefer the infusion—when freshly made of good leaves. However, the tincture is most widely employed. Its better keeping quality, the ease of regulating the dose, etc., recommend it. The powdered leaf in tablet or capsule is efficient and convenient

for continued administration. The green capsules of Upshur-Smith (gr. 1 each) are very reliable, also the digifoline tablets of the Ciba Company. The hypules of digifoline are the best preparation on the market for hypodermic use. When one gets accustomed to a certain reliable preparation it is perhaps well to adhere to it as a routine, in as much as he learns by experience how to regulate the dosage. For some time I have been using with much satisfaction the Upshur-Smith tincture or the Squibbs fat-free tincture—occasionally also the capsule or the tablet above mentioned. For emergencies or in cases of vomiting, the digifoline hypodermically. As the drug is slowly absorbed and slowly eliminated the intervals between doses would be long if large doses are being given.

Dosage. Eggleston well sums up the administration in the following three methods:

1. Small dose method. This requires from four to six days to establish digitalization. Of the dried leaf two to five grams—or twenty to forty min. of the tincture, is given every four hours—four doses daily.

2. Large dose method. Requiring one to two days. For the first twenty-four hours, six to seven grains of the dried leaf or one teaspoonful of tincture every six hours day and night for four doses. On the second day reduce the doses by one-half and give every four hours continuing thus to full digitalization.

Body weight method. Which permits full digitalization in from ten to twenty-four hours. In this method about one to two min. per pound are given in divided doses per day. The "Eggleston Method" is explained in the American Medical Association Journal March 13, 1920. This method employs the "cat unit"—which is the weight of the dry leaf in milligrams which will kill one kilogram of cat, given intravenously continuously. This works out one hundred milligrams of the drug in the cat unit. For man the average total amount for oral administration is equal to 0.15 cat unit per pound body weight.

C. U.  $\times$  0.15  $\times$  wt = grams dry leaf for total:

1000

C. U.  $\times$  0.15  $\times$  Wt. = C. C. of tincture for

100

total amount. For a man of 150 lbs., this would work out 22.5 C. C. for total amount to be given to secure digitalization. Of this 1-3 to 1-2 is given in the first dose; in six hours, 1-5 - 1-4; after another six hours, 1-8 - 1-6; then 1-10 every six hours to full effect. It is of course understood that such doses are used in cases of urgent heart failure with the patient strictly confined to bed under close

supervision. They should not be given to a patient who has been taking the drug within the previous two weeks. Pardee in an article on the intravenous and hypodermic administration (*Journal American Medical Association*, October 31, 1925) makes the following statement.

1. With minimal effective doses of digifolin intravenously the T wave and rate in untreated auricular-fibrillation are not affected until from five to six hours.

2. After doses of tincture by mouth equal to one minum per pound of the patient's weight, the T wave and the rate in untreated auricular fibrillation may be affected as early as the second hour and reach its maximum by the sixth or seventh hour.

3. After rectal administration in doses larger than one minum per pound the T wave was affected on the average in two and one-half hours. The facts first noted make it seem probable that the promptness of action is more dependent on a mass effect of digitalis—the large size of the dose—than on the greater promptness with which the drug comes in contact with the heart muscle after intravenous administration.

In ambulant cases of minor heart failure one does not of course resort to such large doses. One to two grains of powdered leaf three times a day or 20-30 m. t.i.d. of potent tincture will more slowly but more safely prove effective. After the heart is once under the influence ten to twenty-five min. twice a day will ordinarily maintain the effect.

#### CONCLUSION

1. Digitalis is indicated whenever the myocardium is too weak to maintain an efficient circulation independent of the cause of that failure with a few exceptions.

2. With large doses of a good preparation in acute or severe failure, prompt response may be had.

3. Massive doses should only be used in patients confined to bed, closely watched, prompt reduction of dose and prolongation of interval between doses after digitalization and administration suspended.

4. Signs of toxic action are nausea, heart block, fibrillation, diarrhoea, coupled pulse.

#### RECTAL PAIN\*

RUFUS C. ALLEY, M. D.

Lexington

The interpretation of abnormal sensations arising in the region of the rectum may spell the difference between success and failure in the treatment of anorectal disease.

Pain probably heads the list of rectal complaints which bring the patient to the physician. The character, location and time of the pain offer valuable diagnostic information.

An accurate knowledge of the anatomy and physiology of the anus and rectum is necessary to evaluate and explain the symptoms arising in this region. The most important embryologic changes that take place in the formation of the anorectal canal occur during the third month of intrauterine life (1). During this period the embryonic anus or proctodeum, which is first seen as a perineal dimple, gradually fuses with the descending hindgut which is later to become the rectum. The small intervening diaphragm of mesoblastic tissue is compressed and either absorbed or pushed aside. Thus it is seen that the anorectal canal is composed of the rectum above, which is developed from entoderm, and the anal canal below which is of ectodermal origin. The line of separation, originally marked by the septum, becomes the anorectal line and forms the sharp line of transition between the rectal mucous membrane above and the skin lining the anal canal below.

This zone is of great proctologic significance and clinical importance (2). The area above and below this line are essentially different in blood, nerve, and lymphatic supplies and, as will be pointed out, in pathologic changes and resulting symptoms.

The arterial supply above the anorectal line is derived chiefly from the superior hemorrhoidal artery, which is a continuation of the inferior mesenteric, while the venous return from this area is through the superior hemorrhoidal veins into the portal circulation. The vascular supply of the anal canal, on the other hand, is connected with the hypogastric vessels and the general circulation. The lymphatic drainage above the anorectal line is upward into the regional pelvic and lumbar glands; the anal lymphatics, with those of the perineum, drain for the most part into the inguinal chain (3).

The nerve supply is of especial importance in anorectal symptomatology (2). The rectum down to the anorectal line is supplied by the sympathetic and sacral autonomic systems. The anal canal derives its nerve supply

\*From Proctologic Section, Lexington Clinic.

\*Read before the Fayette County Medical Society July 12, 1932.



directly from the cerebrospinal system via the pudendal nerve from the second, third and fourth sacral roots. This remarkable difference in nerve supply explains the almost complete absence of pain sense in the rectum while the anal region is exquisitely sensitive to pain. (Fig. 1.)

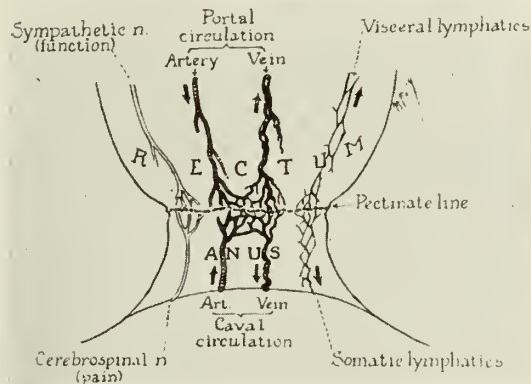


Fig. 1. Schematic drawing showing differences in blood, lymphatic and nerve supplies above and below the anorectal (pectinate) line. (J. R. Pennington, "Rectum, Anus and Pelvic Colon," Philadelphia, P. Blakiston's Son & Co.)

Thus it is easily understood why serious organic disease of the rectum may progress to a hopeless stage without producing pain. The usual manifestation of organic rectal disease is disturbance of function. For example, the earliest symptoms by which cancer of the rectum may be suspected are functional. Changes in bowel habit are most important. Bleeding is a first symptom in 40 per cent of cases (3). Pain becomes a factor only after secondary invasion of adjacent sensory nerve trunks has occurred.

The extreme degree of pain that may be produced by comparatively small anal lesions is well known. The anal canal is abundantly supplied with sensory nerves and in this region small and superficial lesions may produce pain, the intensity of which is out of all proportion to the extent of the causative factor. It has been said that in anorectal disease the intensity of pain is in inverse ratio to the seriousness of the condition (4).

The most frequent cause of anorectal pain is infection of which many varieties are recognized. It may vary from the small superficial anal fissure or ulcer, with its severe, lancinating pain, to the extensive perianal abscesses producing serious constitutional symptoms. (Fig. 2.)

The path of entrance of the infection is almost always through a crypt of Morgagni, and the posterior crypts, because of anatomical factors, are most frequently involved (2). The infection may remain well localized or it may burrow through surrounding tissues in

any direction and produce simple or complicated abscesses and fistulae.

Thrombotic external hemorrhoids are sometimes the cause of distressing anal pain (Fig. 3). The onset is usually sudden, often following trauma or muscular straining, and the extravasated blood produces an astonishing amount of pain due to pressure under the sensitive anal skin. The pain is usually completely relieved upon evacuation of the clot. This should always be practiced both to relieve the patient and to avoid infection and abscess formation which the clot invites (5).

The widespread belief that internal hemorrhoids per se are painful is incorrect. Internal hemorrhoids are located above the anorectal line where pain nerves are absent, or nearly so, therefore pain accompanying this type of hemorrhoids is due to some complicating factor. The most usual complication producing pain is infection which extends down into the sensitive perianal tissues. This causes painful spasm of the sphincter muscle which is usually attributed to hemorrhoids if they are known to exist. (Fig. 3.)

The impaction of foreign bodies in the anorectal canal is relatively rare but when it does occur it may produce pain varying from a dull ache to that of lancinating severity, depending upon the size and shape of the offending element and the anatomical region in which its progress is arrested. The greatest

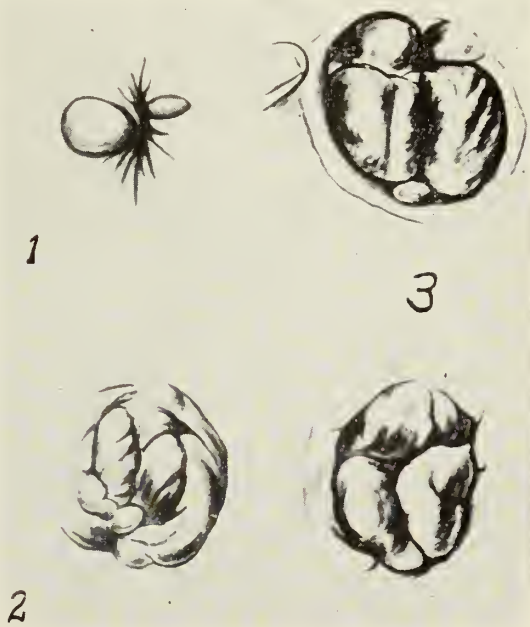


Fig. 2. Types of hemorrhoids: (1) External thrombotic hemorrhoids. (2) Internal hemorrhoids with edema of anal margin. (3) Prolapsing internal hemorrhoids. (J. P. Tuttle, "Diseases of the Anus, Rectum and Pelvic Colon," New York, D. Appleton & Co.)



Fig. 3. Hypertrophied anal papilla and abscess from infected crypt. (Dr. C. F. Martin's case.)

danger here lies in perforation and subsequent infection.

True rectal neuralgia is undoubtedly a distinct clinical entity but its occurrence is rare. If real pain exists it is nearly always caused by organic lesions affecting sensory nerves, however, as pointed out by Pennington (2), in about one case in five hundred no pathological cause can be demonstrated. Albu (7) states its subjects are always neurasthenic and that some form of psychic stress is present. Diagnosis of rectal neuralgia should be made guardedly and only after failure of exhaustive effort to find the real cause.

It is well known that extremely disagreeable sensations may originate in the rectum even though it has no cerebrospinal nerve supply. The afferent nerve endings in the wall of the rectum and large bowel are sensitive to increased muscle tonus (6). A moderate increase in muscle tension, due either to distention or to contraction, produces desire to defecate, while undue distention or spasm, associated with reflex straining may be decidedly unpleasant. Such conditions are encountered in low rectal obstruction from any cause such as fecal impaction, fibrous stricture, malignant growths, or occlusion of lumen by a foreign body. It is easily seen that the symptoms produced in this way are primarily functional. The production of abnormal secretions by malignant growths and the simultaneous infiltration of the bowel wall produce early perversions of function which, unfortunately, are so often overlooked.

#### SUMMARY.

1. The anus and rectum are essentially different from the standpoint of embryology, anatomy, and physiology.

2. The anorectal line is an important landmark anatomically and clinically.

3. The manifestations of disease above the anorectal line are essentially functional while below it pain usually predominates.

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### A CASE OF DERMATITIS CAUSED BY BUTESIN PICRATE\*

ROBERT L. KELLY, M. D.

Louisville.

Butesin picrate ointment was placed on the market about 1926. Since this time, there have been several cases of dermatitis reported due to this ointment.

In reviewing the literature, I find that Doctors Pusey and Rattener reported the first cases in June, 1929. Their first case followed its application to a dry dermatitis due to a mustard plaster. Dr. Riley Jackson reported five cases in January, 1929. Three of his cases were due to butesin picrate ointment and two cases were due to picric acid solution.

I have had four cases of dermatitis due to butesin picrate ointment. Two of these were due to my application and two to self application. One of the latter I shall report tonight. A married woman, age 26, was referred to me by a physician, with an acute, weeping vesiculo-bullous dermatitis of left thumb and index finger, extending on dorsal and palmar surfaces of hand, having the usual symptoms of itching and burning. She gave a history of burning the tips of her thumb and index finger on a cooking utensil four days before coming to me. Her husband had been using butesin picrate for burns, with impunity. She applied it to the burn, and a few hours later the lesion became worse. She re-applied the ointment daily for three days.

I did a patch test on the outer surface of the left thigh; ten hours later there was an erythematous, vesicular eruption about 3 inches in diameter. (See Fig. 1.) The following day patient returned, and this area had become one solid bullous lesion. (See Fig. 2.)

\*Read before the Jefferson County Medical Society, May 2, 1932.





Fig. 1



Fig. 2

I believe that butesin picrate ointment is a treacherous ointment to be applied promiscuously. There is more dermatitis due to this ointment than is reported. In cases where the ointment is to be used extensively, a patch test should be done to determine the susceptibility of patient.

There are many cases of dermatitis reported where the alcoholic solution of picric acid is used in preparing the field of operation. It seems that the watery solution is not as irritating.

#### CONCLUSION.

1. This ointment does cause dermatitis in susceptible individuals.
2. It should not be applied to extensive lesions until a patch test has been made.
3. We should be careful in using any drug promiscuously until its action has been definitely ascertained.

#### DISCUSSION

**Winston U. Rutledge:** Mr. Chairman, I feel called upon as a Dermatologist to say a word about Dr. Kelly's very interesting case report.

After reading the announcement of Dr. Kelly's

forthcoming presentation, I looked up a few articles on this type of dermatitis, and as far as I could find out very few cases of this particular kind have ever been reported. In 1923, a French Dermatologist reported in the "Annals of Dermatology and Syphilology" two cases of dermatitis similar to this one, due to application of wet dressings of a picric acid solution; however, he did not mention having used an alcoholic solution. A year later, Dr. Arthur Greenwood reported a case of a genito-urinary surgeon who had a very severe case of dermatitis which was found on subsequent tests to be due to butesin. Apparently, this man had been using a solution of butesin for two years in his genito-urinary work without having suffered any evident damage from it. The dermatitis began on his fingers, then became generalized, and on one occasion the burning on his penis becoming so severe that he injected a 2 per cent solution of butesin subcutaneously in that area to relieve this pain. Naturally, this aggravated the condition. Considering the wide-spread use of butesin picrate in all kinds of cases, with only a few cases or resulting dermatitis, it speaks fairly well for its low toxicity.

**Leon L. Solomon:** I ask permission to say a word about butesin picrate. I have had considerable experience with this product. I am aware of its irritant action. Like many of the newer preparations, brought to the notice of the specialist and the general practitioner, which they are asked to use routinely in their practice, investigation having previously been made by certain individual manufacturers, and sometimes by hospital groups, not until the product has been put to the acid test of general use is it found to be deficient or defective and sooner or later must fall into disuse.

Extravagant claims are these days frequently made by the pharmaceutical houses concerning this, that, or the other new product of their manufacture. The pity is that we have gotten away from the materia medica known by our forefathers and are willing to try out almost anything that is brought to our notice. Every now and again the supreme penalty is paid when, had proper investigation been made, misfortune would have been avoided.

The surprising thing is that a larger number of people have not been found sensitive to butesin; perhaps its dermatological reaction belongs to allergy.

I desire to make a plea this evening for return to the rational therapy of our fathers. The day was when materia medica and therapy was allotted proper consideration in the college curriculum. Today, the student of medicine is given a mere glimpse at the subject, the study of which is fascinating and the comprehension of which is most important. There is foisted on the profession a list of somnifacient drugs, each one

vaunted as the prince of its class. For the most part, they are related to trional and sulphonal, or they contain some derivative of the barbiturates. There is no reason under high heaven for their multiform existence except that one pharmaceutical house is in competition with the other and none seems satisfied until his list is as full and complete as that of each of his competitors.

It is amazing to know the variety and number of antiseptics which have recently been brought to our attention. Some are red, some are green, some are violet, some are purple, some are yellow. And again, there is no reason for their existence, except that one house is in competition with another. The much vaunted mercurochrome has not justified the repute into which it was brought. It is in no sense the equivalent in virtue to icline.

Dr. Kelly deserves the commendation of his fellows for having brought to their attention the untoward action of butesin picrate.

**C. Brooks Wilmott:** I have had no personal experience with dermatitis such as mentioned by Dr. Kelly. However, I remember seeing my first case of a dermatitis similar to the one reported this evening, in the Post Graduate Hospital, New York City, during my internship, which was thought to be due to picric acid, then much in vogue as a treatment for burns. It was used as an alcoholic solution of picric acid in the form of wet dressings on superficial burns. I use that in my general work quite often, and do not remember ever having gotten a dermatitis from it. The drug used by Dr. Kelly, in the form of a salve, I wonder from the fact that it is mixed with a greasy ingredient if this would not tend to irritate the surface of the skin and cause a dermatitis?

**Robert L. Kelly** (in closing): As I said in my case report, there have been several cases of dermatitis reported due to butesin picrate ointment and by the alcoholic solution of picric acid. Possibly we shall have several cases reported in the future.

Dr. Wilmott's inquiry about the greasy base. I doubt if the greasy base has anything to do with the dermatitis. Butesin picrate ointment is a chemical combination of butesin and picric acid in a greasy base. The combination may be more irritating to susceptible individuals than straight picric acid or butesin.

We, at times, get a dermatitis from any local application in susceptible individuals; but I think it is worthwhile to watch butesin picrate ointment.

## STERILIZATION FOR HUMAN BETTERMENT\*

A. M. LYON, M. D.

Frankfort.

There is no subject that should concern society and the human race more than the production of healthy, energetic posterity. Every patriotic and God-fearing citizen should put forth every available means to gain that end. The establishment of this great nation of our was conceived and dedicated to the principle that all men were created free and equal. I challenge that statement for today, particularly from the biological standpoint. Does the childhood of America arrive free from handicaps that may mar their adjustment to society? Is the blood stream of the infant free from pollution that will engender its development into normal manhood or womanhood. If some arrive from polluted germ plasm then they are not equal.

Upon whose shoulders rests the responsibility of incapacitation of the future childhood in this county if every child has the inalienable right to be born free from disease or contamination that would render his existence a misery to himself or to those that surround him. Science has not yet said the last word neither will it ever be said as we drift into the unfathomed realms of the dim distant future. Facts will be unveiled that will better enable us to increase our identity whereby we will be in a position to preserve and promote human welfare.

What is the problem that confronts the grand old Commonwealth of Kentucky. Do we invite the production from torrents of polluted germ plasm or shall we take steps, approved by Science, to dry-up the springs that feed into the biological machine contaminated germplasm for reproduction. Sterilization for human betterment is a remedy directed at the chief source of our great charitable problem. It has been positively proven, beyond a doubt, that seventy per cent of mental defectiveness arrives from defective hereditary channels. We know that like begets like. Statistics show that there are three times as many defectives per population as there was in 1880. It is conservative to conclude that one-half of one per cent of the population of Kentucky are so defective that they cannot make adjustment to meet necessary accommodation for a comfortable existence, and I think it would be safe to state that as high as one per cent are so incapacitated that unless they are directed

\*Read before the Fifth District Medical Society, Carrollton.



by close supervision they would be a menace to society.

Assuming that one per cent of Kentucky's population are defective, where do we stand and what is the extent of our efforts—we would have 25,000 mental defectives in Kentucky. Assuming that ten per cent should be institutionalized we should have 2500 in an institution for the feeble-minded; whereas we have slightly more than fifty per cent of that number. Now, what are the consequences if we permit the remainder to roam at large and procreate their kind as time goes on?

Sterilization is not a punitive procedure. Is it not better to prohibit the birth of one who will be so incapacitated as to render his existence painful, burdensome and oftentimes criminal. Something must be done. Shall we continue, in our neglectful way, to provide and encourage the flow of weaklings upon society? Can we resort longer to segregation or shall we resort to the more radical, and yet humane procedure, to alleviate society's great burden. It is better to have never been born than to be brought into existence so maimed mentally that you cannot realize the beauty of life, recognition of your surroundings and the avoidance of criminality.

How often have I seen the mother of a demented child, whose causation was heredity, ring her hands, tears flowing from her eyes, muttering in an attitude of prayer that her child's life might soon end although a truly manifested mother-love was evident. The greatest asset to any nation, state, country or home is its bright, healthy, alert, smiling childhood. To possess that great treasure, we must place into the channels of reproduction germplasm that is free from every contamination.

Human sterilization does not unsex or remove any gland that will infringe upon the physical condition of an individual. It has no effect upon the sex of an individual. It only strikes from the picture the power to reproduce. In the female it oftentimes renders a desirable effect upon the nervous and mental attitude of the individual. I daresay that any parent who knew that their off-spring was going to be mentally defective, would never bring into existence its being.

Now let us view it from the standpoint of the religious objector. The simplicity of this operation, because of the anatomical make-up of the structures involved in sterilization, leads me to believe that God, in His infinite wisdom, so arranged that we may take advantage of it. Nature has rendered ninety per cent of idiots incapable of reproduction. Further still when a mother turns down the other side of life, nature institutes the meno-

pause which, of course, renders her incapable of reproduction. Again, if a woman becomes infected with gonorrhea it is plain to understand that nature, with her esteem for a normal off-spring and in order to avoid bringing into being one handicapped as a result of that infection of the mother, the lumen of the fallopian tube is closed and this forever obliterates the female cell thereby rendering her sterile. Further still, I wish to add that there is more religion in prohibiting the production of degenerate defectives than there is in letting them be brought into being. What is more tragic than for us, as a result of cowardice, to hug the delusive phantom of hope and permit our civilization to be saturated with degeneracy. Then the once-idolized country will abound in ignored morality, universal theft, ravaged virtue and merciless murder. Sir Thomas Brown once said, "Give thanks to Heaven, not that thou wert born in Athens, but that thou wert born from noble parents and that honor, virtue and integrity lay in the same egg and came into the world with thee."

I contend that the State, as a civic unit, has the right to sterilize her defectives and I can refer you to no greater authority than the words of Justice Holmes, a member of the highest tribunal of the land, in the case of the State of Virginia versus Buck, May 2, 1927, in which he stated in part: "We have seen more than once that the public welfare may call upon the best citizens for their lives. It would be strange if it could not call upon those who already sap the strength of the State for these lesser sacrifices, often not felt to be such by those concerned, in order to prevent our being swamped with incompetents. It is better for all the world, if instead of waiting to execute degenerates off-spring for crime, or to let them starve for their imbecility, society can prevent those who are manifestly unfit from continuing their kind. The principle that sustains compulsory vaccination is broad enough to cover the cutting of the Fallopian tubes. Three generations of imbeciles are enough."

I do not contend that sterilization is a panacea and that it will relieve us of our charitable burden and social misfits. Segregation has a higher rank in my estimation but I do think that sterilization will work synergistically and bring about better results. It will enable us without fear to parole at least twenty per cent of the present population of the State Institution for the Feeble-Minded. By so doing, we will be able to open an avenue of release whereby we may take in and care for other unfortunates.

Both from a safety and economical standpoint, I wish to detail the following facts: Some few years after the close of the Civil

War, a widowed Civil War veteran, after procuring a pension though on the declining side of life, decided he wanted to marry. He did not want a wife of his own age but preferred a much younger woman. Due to his elderly condition and probably his general appearance he could not interest a young normal individual, so he married a girl who was mentally defective; I judge from the information probably a high grade imbecile. As a result of that marriage there were born six children. In a few years the father died. The mental incapacitation of the mother, although allowed the pension prescribed by the Federal Government, made her unable to care for her children. They were sent to the Feeble-Minded Institution and four of them remained there for over thirty years. One of them is now paroled and another has been away from the institution for a number of years. Estimating conservatively, these four that have remained here have cost the State more than \$40,000. The point I wish to make is—how much easier for the authorities then in charge, to have prohibited the marriage of this mental defective than for the taxpayers to pay for their maintenance.

Another outstanding example of society's actual and probable burden: A husband and wife, apparently normal but having a taint of degeneracy, have had born in their home twelve children, six of which are definitely defective mentally. Two are now in the institution, two of the defective ones died and the two remaining defectives are at home with a constant plea for admittance to the institution. Due to our overcrowded condition we could not take them; then the father proposed that we exchange and give him the best one here for one of the children at home. Can you conceive of a citizen of the dignified Commonwealth of Kentucky having to resort to such tactics to get probable domestic relief.

Just in passing, I want to show you what it would mean in dollars and cents, assuming that it would take \$240.00 per annum for the care of an inmate in the Institution for the Feeble-Minded. If we could only sterilize and release one hundred, it would alleviate the tax-payers of Kentucky the sum of \$24,000 annually.

Let me assert again that the greatest treasure of humanity is a normal, healthy, energetic smiling childhood. The greatest liability of home or all the country is its degenerates. Many of the atrocious crimes can be assigned, truthfully so, to mental defectiveness. Crime feasts on mental defectives and flourishes in an atmosphere that surrounds those who are border-line or slightly sub-normal mentally. Shall we permit the birth and unwatched existence of him who is unable to

cope with our laws of society and if he commits an atrocious crime then punish him by placing him in an electric chair and extract from that body a life whose short-comings rests upon the shoulders of organized society. This to my mind is the greatest insult to the teachings of the Son of Bethlehem. It is the blackest picture that I can conceive through the Ages except that shadow of shame that haunts Golgotha's brow.

In the words of Rose Trumbull is heralded a call to improve the integrity and identity of those that will follow on:

You talk of your breed of cattle  
And plan for a higher strain,  
You double the food of your pasture,  
You heap up the measure of grain;  
You draw on the wits of the nation  
To better the barn and the pen  
But what are you doing, my brother,  
To better the breed of men?

You talk of your roan-colored filly,  
Your heifer so shapely and sleek,  
No place shall be filled in your stanchions  
By stock that's unworthy and weak.  
But what of the stock of your household,  
Have they wandered beyond your ken  
Or what is revealed in the round-up  
That brands the daughters of men?

And what of your boy? Have you measured  
His need for a growing year?  
Does your mark of his sire on his features  
Mean less than your brand on a steer?  
Thoroughbred—that is your watchword  
For stable and pasture and pen,  
But what is the word for the homestead?  
Answer, you breeder of men!

#### NEWS ITEMS

His many friends in and out of the profession will be glad to know that Doctor W. R. Thompson, who, for several years, has been the efficient Superintendent of the Eastern State Hospital at Lexington, will locate in Lexington and will confine his practice to nervous and mental diseases.

Dr. Frank C. Bohannon, associate of the late Dr. Chas. G. Lucas, announces that he is limiting his practice to Gastro-enterology at 605 Breslin Medical Arts Building, Third and Broadway, in Louisville. Dr. Bohannon's office hours are 9 to 1, except Sunday, and by appointment; office phone, City 787; residence phone Shawnee 6986.

Dr. William R. Thompson announces limit of practice to nervous and mental diseases at 119 Forest Avenue, Lexington, Ky. Consultations by appointment; phone Ashland 375.



**BOOK REVIEW**

**MODERN GENERAL ANESTHESIA, A PRACTICAL HANDBOOK.** By J. G. Poe, M. D. Lecturer on General Anesthesia in the Medical and Dental Department of Baylor University, Anesthetist of Baylor University Hospital of Dallas, Consulting Anesthetist to Shriner's Hospital for Crippled Children and Parkland Hospital, Dallas, Texas. Second edition, completely revised and enlarged, with 12 illustrations and 2 charts. F. A. Davis Company, Philadelphia, Publishers.

In the revision of this small volume on general anesthesia, an attempt has been made to incorporate the practical advancement in both the general knowledge and the technic of administration of the various agents at our command, without departing from the book's special characteristics—brevity and practicability.

Realizing that the student desires a textbook which classifies the subject in a manner easily comprehended and presenting the information in a concise form, theoretical discussions have been omitted and left for future consideration, as presented in the larger treatises on the subject.

The author has emphasized the necessary precautions and means to render the administration of ethylene and ether safe from ignition, with conclusions verified by over a half million administrations with the closed methods.

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**SURGICAL CLINICS OF NORTH AMERICA.** (Issued serially, one number every other month). Volume 12, No. 3. (Lahey Clinic Number—June, 1932) 299 pages with 123 illustrations. Per clinic year, (February, 1932 to December, 1932.) Paper, \$12.00; Cloth, \$16.00 net. Philadelphia and London: W. B. Saunders Company, 1932.

Those who are familiar with the work of the Lahey Clinic, Boston, will appreciate this volume as its contributors are associated with this clinic. Dr. Lahey has a splendid article on the Present Management of Biliary Tract Disease.

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**UNITED STATES ARMY X-RAY MANUAL.**—Authorized by the Surgeon-General of the Army. Second edition rewritten and edited by Lt.-Col. H. C. Pillsbury, M.C., U.S.A. The Accepted Standard Technic, Interpretation and Apparatus. 12mo. flexible leatherette, 500 pages, 228 illustrations, \$5.00 net. Paul B. Hoeber, Inc., Publishers, 76 Fifth Avenue, New York, N. Y.

This edition has been expanded to include descriptions of the improvement in apparatus and in the methods of interpretation that

have developed since the first edition went to press.

The section on physics has been rearranged to permit more convenient reference, and descriptions of new types of apparatus and appliances have been added. The description of gas tubes and induction coil apparatus have been placed together; gas tubes are an episode in x-ray production that is interesting to all; induction coil apparatus may at some future time return to favor in modified form.

Technique, formerly distributed through the book, has been consolidated in one section. The section describes how films may be exposed and developed. Exposure tables are furnished, that may serve as a basis upon which the operator may build an exposure technique adapted to his own apparatus, and which will best meet his individual problems. As an exception, the technique for exposing sinus and mastoid films is described in the section devoted to their interpretation; the technician making films of these parts must understand the principles of their interpretation or failure will surely result.

In the section on the localization of foreign bodies the description of a number of the methods of localization has been omitted, as the omitted methods were seldom used during the World War.

The sections on interpretation have been amplified and brought up to date. New illustrations have been borrowed from many sources.

The Manual is a condensed description that covers apparatus, technique and interpretation. All reference to therapy has been omitted, as an adequate description is beyond the scope of the book. For the analysis of the unusual case the radiologist should refer to the more detailed descriptions available in the larger works.

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**VARICOSE VEINS, WITH SPECIAL REFERENCE TO THE INJECTION TREATMENT.**—By H. O. McPheeters, M.D., F.A.C.S., Director of Varicose Veins and Ulcer Clinic, Minneapolis General Hospital, Attending Physician New Asbury, Fairview and Northwestern Hospitals, Minneapolis, Minn. Illustrated with 62 half-tone and line engravings. Third Revised and Enlarged Edition. F. A. Davis Company, Publishers, Philadelphia. Price, \$4.00.

This book is a compilation and resume of a most thorough investigation of the literature throughout the world, wherever this work is done, combined with the care of over 2,000 cases actually treated by the author.

A new chapter has been added on the Causes of Failure in the Injection Treatment and also additions to the chapter on Elephantiasis.

# Kentucky Medical Journal

Published Monthly By

THE KENTUCKY MEDICAL ASSOCIATION  
Incorporated

Entered as second class matter October 22, 1906, at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price .....\$5.00  
Edited Under Supervision of the Council

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NEXT MEETING LOUISVILLE

OCTOBER 3, 4, 5, 6, 1932

## COUNTY SOCIETY REPORTS

**Bourbon:** The Bourbon County Medical Society met on Thursday, July 21, 1932, at 8:00 P. M., that being the regular meeting date. The meeting was held in the Court House in Paris, Ky. The meeting was called to order by Dr. J. C. Hart, President.

Members present: Drs. J. C. Hart, C. G. Daugherty, G. C. Rankin, J. A. Orr, W. B. Hopkins, H. M. Boxley, Wm. Kenney, R. M. Blemker, B. N. Pittinger, and the Secretary.

Visitor, Dr. A. O. Sisk, Lexington.

Dr. A. O. Sisk read a paper on "Tetanus" especially with reference to nineteen cases observed in the Lexington hospitals in the last few years.

The discussion was opened by Dr. J. A. Orr and followed by Drs. Boxley, Pittinger, Daugherty, Stern and Kenney; and in closing by Dr. Sisk.

Dr. C. G. Daugherty, Paris, read a paper on "Treatment of Typhoid Fever," and contrasted the present with the past treatment.

Dr. Boxley opened the discussion, which was continued by Drs. Sisk, Kenney, Orr, Rankin and, in closing, by the essayist.

The meeting adjourned at 10:15 P. M.

MILTON J. STERN, Secretary.

**Dry Ridge:** The Grant County Medical Society met at the office of the Health Department Wednesday evening, July 20, 1932, with the following members present: Drs. J. W. Abernathy, president, in the chair, A. D. Blaine, C. M. Eckler, C. D. O'Hara, W. J. Zinn, and C. A. Eckler.

Due to the extreme heat in the room, we decided to transact business as rapidly as possible, omitting our program and leaving it for the next time; we also decided to hold our next meeting in the court house, as it would be much cooler during the heated month of August.

Drs. O'Hara, Abernathy, C. M. Eckler and A. D. Blaine contributed one dollar each for flowers for Dr. Limerick.

The committee on Resolutions of Respect for Dr. R. E. Limerick, deceased, composed of C. D. O'Hara, chairman, D. N. H. Ellis, and Dr. C. M. Eckler, reported through their chairman, Dr. O'Hara, who read the following Resolution:

Mr. President: Dr. Limerick died May 28, 1932. He had until within four weeks of his death been busily engaged in the practice of medicine at Cordova, Grant County, the scene of his birth, his growth and development, his marriage, the rearing of his family, and his death. As a Neophyte fresh from his college life, he threw in his lot with the land of his birth and the home of youth and for almost 50 years he served his own people. Through storm and stress, in birth, in life, in sickness, in death; through climatic rigor and seasonal change and nature's wildest frenzies he went among them



a loved physician, well worthy of their confidence, their respect, their admiration; generous, kindly, unselfish, he was ethically correct, honorably constructed, a dignified co-worker, we knew him to be. Discretion, he had had tested by a hundred secrets, tact he had tried in a thousand embarrassments, and what are more important than a Herculean cheerfulness and courage.

Thus he went among his people, bringing hope and cheer into the sick room, often enough though not as often as he would like, bringing healing too.

Therefore, be it resolved: That in the death of Dr. R. E. Limerick, his home, his community and this and adjoining counties have lost a successful and worthy physician, a splendid and forward looking citizen, a true Christian gentleman, a sacrificing friend and helper.

Be it further resolved, that his family has the compassion and sympathy of this Society for the loss of a patient, noble, indulgent parent and that the medical profession and the Grant County Medical Society alike sincerely deplore the passing of Dr. R. E. Limerick, whose experience was so rich, whose counsel was so wise, whose capacity was so replete and whose usefulness was so general.

Resolved, that a copy of these Resolutions be sent to his family, and a copy furnished the Grant County News and a copy sent to our State Journal.

Respectfully submitted,

C. D. O'HARA,

N. H. ELLIS,

C. M. ECKLER,

Committee.

After a few case reports and assigning the topic "Diarrheas" for our next meeting with Dr. Harry F. Mann, to open the discussion we adjourned to meet the third Wednesday in August.

C. A. ECKLER, Secretary.

**Third District:** The Third District Medical Society met with the Warren County Medical Society in Bowling Green on June 17, 1932.

Report of cases.

Dr. L. O. Toomey reported a case of diabetic coma. This was discussed by Dr. B. S. Rutherford.

Dr. Jno. H. Blackburn reported a case of micrococcus tetragenus. This was discussed by Dr. Irvin Abell, Louisville.

Dr. G. Y. Graves reported a case of old imperforate anus which had been operated on in infancy 27 1/2 years ago. He also reported a case of perforation of two gastric ulcers in a 29-year-old patient.

Dr. W. H. Neel reported a case of diverticulitis of caecum.

Dr. Finis London reported a case of collapse from hemorrhage due probably to ulcer.

Program:

Dr. Irvin Abell, Louisville, read a paper on "Surgical Treatment of Retrodisplacement and Prolapse of Uterus." This was discussed by Drs. E. W. Stone, Donnelly and Blackburn.

After luncheon, Dr. Chas. F. Anderson, Nashville, read a paper on "Transurethral Correction of Prostatic Obstruction." This was discussed by Drs. Rutherford, Bell and Blackburn.

Dr. O. N. Bryan, Nashville, read a paper on "Pernicious Anaemia." This paper was discussed by Dr. Walter Byrne.

Dr. A. D. Donnelly, Bowling Green, read a paper on "Bohler Treatment of Fractures." This was discussed by Dr. G. Y. Graves.

At this meeting it was decided to hold a meeting of the Third District Society every other month—six meetings a year, four in Bowling Green, one in Glasgow and one in Hopkinsville.

JNO. H. BLACKBURN, Secretary.

#### IN MEMORIAM

Dr. Omar H. Shively

It is with sorrow that we record the visit of the Grim Reaper to our midst on May 28, 1932.

At this time he claimed as his toll, and removed from our community and professional fellowship, Dr. Omar H. Shively, while yet scarcely past the prime of life.

The physicians of Adair, Green, Marion and Taylor Counties, as individuals, and as a body of his professional brethren, hereby express their appreciation of Dr. Shively as a citizen, a friend and fellow practitioner. Dr. Shively was ever courteous to his fellow doctors, and faithful to his clientele, so his going will be felt as a great loss to his professional associates, and the people whom he served.

Be it Resolved therefore:

First, that this Society express to the wife and daughter he left behind our sympathy in this great bereavement, and commend them for condolence to Him, the supreme author of life, whose every act is inspired by mercy and love, to those who look forward to his appearing.

Second, that this note of appreciation be enrolled in the minutes of this Society, a copy be sent to the family of Dr. Shively, and also a copy be submitted to the Kentucky State Medical Journal.

This resolution was adopted at the regular meeting of the Society in Columbia, June 24, 1932.

#### Dr. John T. Boldrick

Though it is as natural for us to die as it is for us to be born, and all who have done the one will sooner or later do the other, and we believe that the same God who watches over us during the perilous and narrow passage into a separate existence here will watch over us in our passage to the great beyond with the same

solicitude for us at all times, still there is always a sadness in death, but this is emphasized and magnified when it comes at the very threshold of manhood or womanhood, or at the very prime of life when the shadows are still falling toward the West.

It was thus in the taking of Dr. John T. Boldrick, Lebanon, with family and friendly ties that appreciated and rejoiced in his success and with hopes for still many more achievements, he was taken before his ability and his preparation had ripened into rich fruitage to which some are permitted to attain.

Possessed of a kindly and genial disposition, with an energy and an optimism which almost knew no bounds, he was an inspiration to his patients and was a very pleasant confere with his fellow doctors.

Therefore, be it resolved: That we, the physicians of Adair, Green, Taylor and Marion Counties, while appreciating the above and feeling the loss to our Society, and to the community as a physician, that we extend to those whom he served so satisfactorily and efficiently, and especially to his widow and to his dear mother, our most sincere sympathy.

Resolved further: That a copy of this memorial be spread on our register, and one be sent to his widow and mother, and one be submitted to the Kentucky State Medical Journal.

These resolutions were adopted at the regular meeting of the Society in Columbia, June 24, 1932.

### BOOK REVIEWS

**THE EXPECTANT MOTHER'S HANDBOOK.** By Frederick C. Irving, A. B., M. D. Professor of Obstetrics, Harvard Medical School. Visiting Obstetrician, Boston Lying-in Hospital. With illustrations. Houghton Mifflin Co., Boston and New York, Publishers. Price \$1.75.

This is a handbook of obstetrics for the mother written by the Professor of Obstetrics at the Harvard Medical School. It presupposes no knowledge at all, but intelligence and a general interest in obstetrics and allied matters. It answers all the questions which have commonly been asked Dr. Irving during his practice. There is no emotion anywhere, and no elevating sentiment. He states the facts, using the scientific terms, after defining them clearly. He discusses the anatomy of the organs of reproduction, conception, the diagnosis of pregnancy, the growth of the fetus, the general hygiene of pregnancy, diet in pregnancy, minor complications, major complications, preparations for the baby, at the home or the hospital, labor, anesthesia,

obstetrical operations, the lying-in period, and the biological aspects of pregnancy.

**MANUAL OF CLINICAL AND LABORATORY TECHNIC:** By Hiram B. Weiss, A. B., M. D., F. A. C. P., Associate Professor of Medicine, College of Medicine, University of Cincinnati, Cincinnati O., and Raphael Isaacs, A.M., M.D., F.A.C.P., Associate Professor of Medicine, Assistant Director of the Thomas Henry Simpson Memorial Institute for Medical Research, University of Michigan, Ann Arbor, Mich. 4th Edition, Reset. 117 pages with diet table. Philadelphia and London: W. B. Saunders Company, 1932, Cloth, \$1.50 net.

The data in this manual and the texts are compiled with the idea that the book may be used as a guide for the standardization and correlation of work. It is planned to give the student or general practitioner an outline which he can follow in a systematic study of his patients. The tests given are those in most common use and only essential details are given.

**SURGICAL CLINICS OF NORTH AMERICA.** (Issued serially one number every other month.) Volume 12, No. 2, (New York Number—April, 1932) 306 pages with 84 illustrations. Per Clinic year (February, 1932 to December, 1932). Paper, \$12.00; Cloth, \$16.00 net. Philadelphia and London: W. B. Saunders Company, 1932.

The contributors for this volume are from the various hospitals and clinics in New York City. Of special interest is Dr. Eastman Sheehan's article on Reparative Surgery.

**Correlation of Protective Value in Antipneumococcus Serum.**—Felton studied thirty-nine freshly drawn polyvalent type I and type II antipneumococcus horse serums to find the degree of correlation between the protective titer and various immunologic reactions; namely, specific precipitation, agglutination, neutralization and immune protein precipitable by soluble carbohydrate. He found that for type I the correlation coefficient between protection and precipitin titer is 0.93; between protection and agglutination it is 0.80; between protection and neutralization it is 0.88, and between protection and the amount of protein precipitated with specific carbohydrate it is 0.91. From this degree of correlation it appears evident that, at least for type I freshly drawn serums, immunologic examination other than the expensive mouse protection test can be utilized to estimate the probable therapeutic activity and to standardize antipneumococcus serum.





*Philip F. Barbour*

PRESIDENT KENTUCKY STATE MEDICAL ASSOCIATION, 1932





# KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. 30 No. 10

BOWLING GREEN, KY.,

OCTOBER, 1932

## THE ANNUAL MEETING

The physicians of Kentucky and their wives are always glad when the time comes for the Annual Meeting of the Kentucky State Medical Association to be held in Louisville.

Louisville is the metropolis and medical center of Kentucky. It contains a large percentage of the wealth of the State and pays a large proportion of the taxes which go to the support of the State government. It is the seat of the medical department of the University of Louisville, which is the survivor and successor of the first medical school west of the Alleghenies. Something like one-third of the physicians in the State are located in Louisville and its hospital facilities are among the best to be found anywhere in the South. The Jefferson County Medical Society, which will be host on this occasion, is one of the most active medical organizations in the country. Louisville has splendid hotels, and the Committee on Arrangements has chosen "The Brown" as headquarters for the Annual Meeting. This delightful hostelry is making active preparations for the comfort and pleasure of the visiting physicians and their families.

Our guest speakers have reputations extending beyond the confines of this country. Dr. John Lovett Morse, of Boston, former President of the American Academy of Pediatrics, is among the real orators in the profession. Dr. Ira B. Hiscock, New Haven, Connecticut, is a member of the faculty of Yale University and will be the speaker at the banquet on Wednesday evening. Dr. Howard A. Kelly, Baltimore, Maryland, distinguished author and naturalist, will speak Sunday evening at the Warren Memorial Church and again on Monday evening before the Jefferson County Medical Society at the City Hospital.

The scientific program for the session, arranged by the Committee composed of Dr. Philip F. Barbour, President-Elect, who is ex-officio chairman, and his associates, Dr. O. R. Miller, with the Secretary of the Association acting as ex-officio secretary, is among the best and most complete ever presented to the medical profession of Kentucky. In numbers we have more distinguished guest speakers this year than at any previous meeting. President-Elect Barbour urges members to be in their seats in the Roof Garden of the

Brown Hotel, where all the scientific sessions will be held, promptly on the opening day and continue in attendance throughout Tuesday, Wednesday and Thursday, October 4th, 5th and 6th.

The Council will meet at 10:30 A. M., in the Ball Room of the Brown Hotel; the House of Delegates will meet in the same room at 2 P. M. Monday.

In this issue of The Journal the delegates and members will find the report of the Auditor, giving in detail form of voucher check every item of expense incurred during the fiscal year. The Constitution and By-Laws of the Association and County Societies are also republished. Delegates are urged to familiarize themselves with these reports and be prepared to act upon them and upon any other matters that they may desire to bring before the profession. The Association is a truly democratic organization; each and every member has a voice in its management.

The League of Christian Physicians of the Kentucky State Medical Association will hold its services at the Warren Memorial Church Sunday evening, October 2. Dr. Howard A. Kelly will be the speaker.

The Exhibits have always been an important feature of the Annual Meeting and contribute materially to paying the expense of its holding. This year we have secured an unusual number of attractions and commercial displays. Every doctor is urged to visit them.

Everything indicates that the Louisville session will be among the largest in attendance and the best from the viewpoint of scientific interest and medical education that the Association has ever held. We hope to see every member in Louisville for the entire four days, October 3-6.

## DR. HOWARD A. KELLY

The Kentucky State Medical Association is fortunate in having Dr. Howard A. Kelly, of Baltimore, Maryland, as one of its distinguished guests at the approaching Annual Meeting.

Dr. Kelly is one of the most famous surgeons in America. He is also an authority on radium and a well-known naturalist. A member of many scientific organizations in several countries, he is the author of many medical books and biographies and has con-

tributed literally hundreds of articles to medical journals. To his rare genius we owe the re-introduction of the use of radium in the control of cancer. Dr. Kelly was associated with Sir William Osler and Dr. W. H. Welch in Johns Hopkins Hospital and for more than thirty years was a teacher in the University of Pennsylvania, his alma mater.

Dr. Kelly will speak at the Warren Memorial Church, Fourth and Broadway, on Sunday evening, October 2. The subject of his address will be "Other Foundation Can No Man Lay." On Monday evening, at the City Hospital, he will speak before the Jefferson County Medical Society on "Some Reminiscences of Surgery." Both of these will be open meetings. The general public as well as physicians and their friends are invited to be present.

The League of Christian Physicians, comprising Kentucky doctors doing active work in their respective churches and who are members of the Kentucky State Medical Association, are planning to have some distinguished physician each year speak at a central church on the Sunday preceding the general session of the Association.

#### POSTGRADUATE OBSTETRICAL LECTURES

In 1930 Kentucky was fortunate in being one of the states selected by the Federal Children's Bureau to receive the services of Dr. J. R. McCord, Professor of Obstetrics at Emory University, Atlanta, Georgia, for two post-graduate courses of lectures on obstetrics. This was one of the outstanding services offered to physicians by the Bureau of Maternal and Child Health.

Dr. McCord is a gifted and inspiring teacher. During June and July, 1930 he gave one week's course before the physicians of Perry County, and another similar course before the physicians of Barren County, at the Community Hospital, Glasgow, Kentucky. These lectures were sponsored by the local Medical Societies; physicians from surrounding counties were invited. Sixty-five physicians attended the two courses, with an average daily attendance of twenty-eight. It was said that physicians once hearing Dr. McCord, did not miss a lecture thereafter.

We are happy to announce that during the spring and summer of 1933, the Federal Children's Bureau will again offer, through the Bureau of Maternal and Child Health, Dr. McCord's services. Postgraduate lecture courses, covering a period of four or five weeks, will be given. These courses will be sponsored by the Kentucky State Medical Association, the State Board of Health of Kentucky, and the local County Medical Societies. The Federal Children's Bureau will finance

the courses; there will be no charge to any local Medical Society.

At present there are several counties under consideration as suitable locations for the lectures. Announcement will be made later regarding dates and locations.

Each course consists of five lectures, and usually a lecture is given every afternoon, from 2 to 5 o'clock, on five consecutive days of a week, as follows:

Monday: A general talk on the mechanism and management of normal labor; both being carried along together.

Tuesday: The afternoon is opened with a talk on prenatal care, particularly as it concerns the prevention of the toxæmias of pregnancy.

Wednesday: The prophylaxis and pathology of puerperal sepsis are discussed at length.

Thursday: Forceps, version; occiput posterior positions and breech presentations are given.

Friday: Abortions, accidental separation of the placenta and placenta previa are studied.

#### THE FIRST KENTUCKY WHITE HOUSE CONFERENCE FOR CHILD HEALTH AND PROTECTION

The first Kentucky White House Conference for Child Care and Protection will be held at the University of Kentucky, at Lexington, on October 28 and 29, 1932. Under the above direction of the University of Kentucky, it is anticipated that the Kentucky White House Conference will arouse widespread interest in the problems pertaining to Kentucky's childhood, and, through the Kentucky Conference, the findings of the National White House Conference—which was held in Washington November, 1930—will be given wide publicity, especially as they refer to our state.

The State Board of Health, as a cooperating agency, is vitally interested in the success of this conference, and much work has been done in connection with it by Dr. Annie S. Veech, Director of the Bureau of Maternal and Child Health, and a member of the Conference Planning Committee.

Dr. Philip S. Barbour is Chairman of the Medical Section, which will meet the afternoon of October 29. A most interesting program has been planned. The conference will be attended by representatives from all sections of the state.

The findings of the conference—which these representatives will carry home and present their various communities—will focus the attention of the public on the social, health, and educational needs of Kentucky children. Five phrases of child health will be considered, ma-



ternal health in relation to the child, infant and preschool problems, the school child, control of preventable diseases in childhood, and the psychological aspects of child health.

Stress will be laid on the fact that the child begins life nine months before it is born, and that its health is so dependent upon the health of the mother that her general well being, health habits and diet must be such that the baby will have the opportunity to be well born.

Problems of infancy will be stressed from the angles of proper feeding, habit training, and the establishment of correct health habits for life. Discussion of the pre-school child will emphasize the importance of recognizing the so-called neglected period, and the necessity of safeguarding the child so that physical defects will not develop.

Problems of the school child and adolescents will also be considered. Immunization as a public health measure, as it relates to children, will be presented, and the problem of protecting children against tuberculosis will be considered. Not only will the positive aspects of health in relation to tuberculosis be discussed, but the prevention of tuberculosis by controlling open cases will be taken up. The discussion of the psychological approach to child health will bring out the importance of physicians learning and understanding modern child psychology.

When the whole public understands the importance of keeping children under the care of the family physician, and the medical profession is universally conversant with the modern changes that come in connection with child care and stress to the parents the things that keep children well, such as safe sanitation, clean milk, immunization against disease, then children will be kept under the care of private physicians. The first Kentucky White House Conference for Child Health and Protection may be confidently expected to do much to bring this about. The hospitable atmosphere of the University of Kentucky, and its scientific approach to the problems of child health, make it a suitable center for the Kentucky White House Conference. The able leadership of Dean William S. Taylor will assure the success of the conference.

#### GOOD WORK WELL DONE

Members of the medical profession should, and doubtless will, read with great interest the chronology of the State organization of the Woman's Auxiliary of the Kentucky State Medical Association, appearing in the accompanying issue of "The Quarterly." The details of county organization are covered in an illuminating ten-year survey.

Especially would the physicians do well to

study the financial report of the Auxiliary appearing in this issue of "The Quarterly" and particularly that portion of the report which deals with the publication of "The Quarterly." It indicates a business ability on the part of the members of the Auxiliary no whit inferior to that manifested by the management of the Association itself.

The Woman's Auxiliary takes just pride in its accomplishments, and it is a pride in which the physicians of the State may well share. As an adjunct to the Kentucky State Medical Association, the Woman's Auxiliary has already performed a wonderful work and the work already done is but a beginning of the still more wonderful work it may confidently be expected to accomplish in the future.

#### HONORS TO KENTUCKY HEALTH OFFICERS

The medical profession in Kentucky, as represented in health work, should feel honored in the awarding to four county health officers Rockefeller Foundation Fellowships entitling them each to a year's special course in Public Health in one or the other of two of the best schools in America. The health officers receiving these awards are Dr. N. A. Mercer, Adair County; Dr. Lewis C. Coleman, Madison County; Dr. Wm. F. Lamb, Lincoln County, and Dr. Russell E. Teague, Wayne County. Dr. Mercer will take his special course at Harvard University, Cambridge, Massachusetts. Drs. Coleman, Lamb and Teague will go to Johns Hopkins University, School of Public Health, Baltimore, Maryland.

In securing the award of these fellowships, the State Board of Health is looking to greater and steadily accelerating progress in public health work in the future. To this end, it is primarily interested in training for effective leadership young physicians who expect to make public health work a life career. The fellowships awarded by the Rockefeller Foundation, upon the requests of State Boards of Health, are made with the distinct understanding that the men receiving the fellowships will return, upon completion of their special courses, to the respective States from which appointed and engage in public health administration. Completion of the special course covered by the one-year fellowship entitles the holder to a Certificate in Public Health, together with eligibility for a second one-year fellowship, leading to the degree of Doctor of Public Health. This is the first time Kentucky has received more than one such award in any one year.

The following physicians have been appointed as temporary health officers in the

counties affected: Adair County, Dr. Brady Roundtree; Madison County, Dr. H. G. Wells; Wayne County, Dr. Mack Roberts; Lincoln County, Dr. J. C. McGuire. The first three have completed limited courses in public health at the University of Kentucky; the last named has had a like course at the University of Michigan.

### GOLF TOURNAMENT

The annual golf tournament will be held at the Louisville Country Club. Playing privileges will be granted at any of the golf clubs by presenting your membership card or official badge of the Kentucky State Medical Association.

Trophies will be given for the low gross and low net; to be eligible for low net your club handicap is necessary. A kicker's handicaps tournament will be held where everyone is eligible. A trophy will be given for each of two lucky numbers.

Players may turn in scores from Saturday, October 1, through Wednesday, October 5. Results will be announced and trophies presented at the banquet Wednesday evening.

Ask any member of the Golf Committee for information.

E. LEE HEFLIN.  
BEN D. CHOATE.  
JNO. STITES,  
D. Y. KEITH, Chairman.

**Peritonitis of Appendical Origin**—Foss calls attention to the fact that acute appendical peritonitis is causing more deaths in this country in individuals under 40 than is cancer, accounting for over 20,000 deaths each year, despite improved operative and postoperative technic and widespread propaganda for early diagnosis and treatment. About 50 per cent of the patients with peritonitis are given laxatives before admission to the hospital. The average length of time intervening between the onset of symptoms and surgical consultation is still too great. In the author's series it was four days. Immediate operation as soon as the diagnosis is made, the removal of the appendix, and ample tube drainage accurately placed constitute the essentials of treatment, while maintenance of water balance and the withholding of fluids by mouth are the chief details of postoperative care. Mortality depends largely on factors controllable prior to the patient's admission to the hospital, and of these, earlier diagnosis and omission of purgation are of particular importance. Comparative mortality statistics are of but little significance unless all the factors are considered, the chief of which is duration of time taking place between the onset of symptoms and the operation.

### OFFICIAL ANNOUNCEMENTS

#### PRELIMINARY PROGRAM

Kentucky State Medical Association,  
October 3-6, 1932  
Brown Hotel.

#### GENERAL MEETINGS

TUESDAY, 9:00 A. M., OCTOBER 4TH

Call to Order by the President, J. T. Reddick, M. D., Paducah.

Invocation, Dr. Tunis E. Gouwens, Pastor. Second Presbyterian Church, Louisville.

Address of Welcome, Hon. William B. Harrison, Mayor City of Louisville.

Response to Address of Welcome, J. W. Scott, M. D., Lexington.

Installation of President.

1. Acute Gall Bladder Disease, W. H. Smith, M. D., Danville.

Discussion by Walter I. Hume, M. D., Louisville.

2. Relief of Prostatic Obstruction Through the Urethra, E. Owsley Grant, M. D., Louisville.

Discussion to be opened by W. T. Briggs, M. D., Lexington.

3. The Treatment of Compound Fractures, C. R. Petty, M. D., Lynch.

Discussion to be opened by Orville Miller, M. D., Louisville.

4. Treatment of General Infection with Blood Transfusion, Walter I. Hume, M. D., Louisville.

SPECIAL ORDER AT 12 M.

ORATION IN SURGERY

R. Glen Spurling, M. D., Louisville.

#### SCIENTIFIC SESSION

TUESDAY, 2:00 P. M., OCTOBER 4

1. Relative Value and Dangers of Spinal and Inhalation Anesthesias, Uly M. Smith, M. D., Louisville.

Discussion to be opened by John W. Heim, M. D., Louisville.

2. Diverticulitis with Report of Unusual Case, Joseph M. Frehling, M. D., Louisville.

3. Lung Abscess and Its Treatment, Oscar Miller, M. D., Louisville.

Discussion to be opened by M. J. Alexander, M. D., Louisville.

4. Stricture of the Urethra in the Female, W. T. Briggs, M. D., Lexington.

PUBLIC MEETING AT 8:00 P. M.

CRYSTAL BALL ROOM

TUESDAY, OCTOBER 4TH

President's Address, Philip F. Barbour, M. D., Louisville.

Annual Oration, John Lovett Morse, M. D., Boston, Mass., President, American Academy of Pediatricians.

#### SCIENTIFIC SESSION

WEDNESDAY, 9:00 A. M., OCTOBER 5TH.

1. Case Reports (Limited 8 minutes each)



a. Carotinia, Winston U. Rutledge, M. D., Louisville.

b. Bronchiectosis, James W. Scudder, M. D., Calhoun.

Discussion to be opened by E. J. Murray, M. D., Lexington.

c. Leprosy in Kentucky, Lillian H. South, M. D., Louisville.

2. Diagnosis and Treatment of Empyema of Childhood, Clark Bailey, M. D., Harlan.

Discussion to be opened by Phillip F. Barbour, M. D., Louisville, and Hart Hagan, M. D., Louisville.

3. Malpractice Suits, J. B. Lukins, M. D., Louisville.

4. Symposium on Anemias (Limited 10 minutes each).

Diagnosis and Treatment of:

a. Eczema, Robert Kelly, M. D., Louisville.

b. Agranulocytosis, Carl H. Fortune, M. D., Lexington.

Discussion to be opened by Morris Flexner, M. D., Louisville.

c. Lymphatic Leukemia, Thomas J. Marshall, M. D., Paducah.

d. Indications in Anemia for Surgery of the Spleen, Austin R. Quigley, M. D., Maysville.

Discussion to be opened by W. E. Fallis, M. D., Louisville.

SPECIAL ORDER AT 12 M.

ORATION IN MEDICINE

Chronic Hypochromic Anemia, Charles N. Kavanaugh, M. D., Lexington.

SCIENTIFIC SESSION

WEDNESDAY, 2:00 P. M., OCTOBER 5TH.

1. Allergy, Armand E. Cohen, M. D., Louisville.

Discussion to be opened by Charles N. Kavanaugh, M. D., Lexington.

2. Calcium Metabolism in Health and Disease, James E. Winter, M. D., Louisville.

3. Relation of Ear, Nose and Throat to General Infectious Disease, A. L. Bass, M. D., Louisville.

Discussion to be opened by Gaylord Hall, M. D., Louisville.

4. Symposium on Obstetrics (Limited 10 minutes each)

a. Pregnancy and Its Complications, J. C. Redmon, M. D., Lexington.

b. Labor and Its Complications, B. S. Rutherford, M. D., Bowling Green.

c. Puerperium and Its Complications, N. C. Witt, M. D., Franklin.

WEDNESDAY, 6:30 P. M. OCTOBER 5

Subscription Dinner, Brown Hotel, for Members of the Association, Wives, Friends and Guests.

ADDRESSES

Ira V. Hiscock, Ph. D., Professor of Public Health, School of Medicine, Yale University.

Mrs. Charles E. Oates, President, Woman's Auxiliary to the Southern Medical Association, North Little Rock, Arkansas.

Mrs. Walter Jackson Freeman, President, Woman's Auxiliary to the American Medical Association, Philadelphia, Pennsylvania.

THURSDAY, 9:00 A. M., OCTOBER 6TH.

CONDUCTED BY THE UNIVERSITY OF LOUISVILLE (Limited 10 minutes each paper.)

1. Radical Treatment of Joint Tuberculosis, R. L. Woodard, M. D., Louisville.

2. Clinical Instruction in Dermatology and Syphilology at the University of Louisville, C. B. Willmott, M. D., Louisville.

3. Studies on Circulation, J. M. Kinsman, M. D., Louisville.

4. Clinical Progress in Obstetrics, Edward Speidel, M. D., Louisville.

5. Early Symptoms of Poliomyelitis, John J. Moren, M. D., Louisville.

6. Surgical Complications in Pneumonia, L. Wallace Frank, M. D., Louisville.

THURSDAY, 2:00 P. M., OCTOBER 6TH

1. Some Causes of Blindness, Claude T. Wolfe, M. D., Louisville.

2. Varicose Veins of the Broad Ligament as Cause of Pelvic Discomfort, Charles W. Hibbitt, M. D., Louisville.

3. Some Practical and Theoretical Points in Oxygen and Carbon Dioxide Therapy, W. Hamilton Long, M. D., Louisville.

4. The Ano-Rectal Abscess, Bernard Asman, M. D., Louisville.

Discussion to be opened by M. H. Puls-kamp, M. D., Louisville.

5. Recent Developments in the Department of Psychiatry, W. E. Gardner, M. D., Louisville.

6. Recent Developments in Pediatrics, James H. Pritchett, M. D., Louisville.

7. Prognosis of Para-nasal Sinus Disease, Walter Dean, M. D., Louisville.

#### Surgical Treatment of Bronchiectasis and Lung

**Abscess**—Harrington states that pulmonary sup-puration is usually progressive. The surgical treatment should be as conservative as possible and consistent with effectual treatment. The most common operative procedures are artificial pneumothorax, phrenicotomy, surgical collapse and partial pneumonectomy. The type of operation depends on the time in the course of the disease that treatment is instituted, the situation and extent of the lesion, and the general condition of the patient. In most cases multiple operative procedures are required to effect symptomatic cure. The operative procedures and results are given concerning 111 cases. There were 10 deaths (9 per cent). In 64 cases (66 per cent) there was cure or from 50 to 90 per cent relief of symptoms, and in 16 cases (17 per cent) symptoms were not relieved.

## OFFICIAL CALL

THE EIGHTY-SECOND ANNUAL MEETING OF  
THE KENTUCKY STATE MEDICAL ASSOCIATION,  
TO BE HELD AT THE ROOF GARDEN,  
BROWN HOTEL, LOUISVILLE

To the Officers and Members of the Component County Societies of the Kentucky State Medical Association:

The Eighty-second Annual Meeting of the Kentucky State Medical Association will convene in the Roof Garden of the Brown Hotel, Monday, Tuesday, Wednesday and Thursday, October 3, 4, 5, 6, 1932.

## THE HOUSE OF DELEGATES

The House of Delegates of the Kentucky State Medical Association will convene in the Ball Room at 2 p. m. on Monday, October 3.

## FIRST GENERAL SESSION

The First General Session which constitutes the opening exercises of the scientific function of the Association will be held in the Roof Garden, Brown Hotel, Tuesday, October 4, at 9. A. M.

## THE COUNCIL

The Council will convene in the Louis XIV Room, Monday, October 3, at 10:30 a. m.

## THE REGISTRATION DEPARTMENT

The Registration Department will be open in the Lobby of the Roof Garden, from 10 a. m. to 5 p. m., on Monday, October 3; from 8 a. m. to 5 p. m., on Tuesday and Wednesday, October 4 and 5; and from 8 a. m. to 12 m., on Thursday, October 6.

## COUNCILOR DISTRICTS

## FIRST DISTRICT

V. A. Stille, Benton, Councilor.

Ballard	Livingston	Crittenden
Caldwell	McCracken	Fulton
Calloway	Marshall	Graves
Carlisle	Trigg	Lyon

## SECOND DISTRICT

D. W. Griffith, Owensboro, Councilor.

Davies	Hookins	Ohio
Hancock	McLean	Union
Henderson	Muhlenberg	Webster

## THIRD DISTRICT

C. C. Howard, Glasgow, Councilor.

Allen	Cumberland	Simpson
Barren	Logan	Todd
Butler	Monroe	Warren Edmonson
Christian	Metcalfe	

## FOURTH DISTRICT

J. I. Greenwell, New Haven, Councilor

Breckinridge	Hardin	Meade
Bullitt	Hart	Nelson
Grayson	Larue	Spencer

## FIFTH DISTRICT

W. E. Gardner, Louisville, Councilor

Carroll	Gallatin	Shelby
Oldham	Henry	Trimble
Franklin	Jefferson	Owen

## SIXTH DISTRICT

R. C. McChord, Lebanon, Councilor

Adair	Green	Taylor
Anderson	Marion	Washington
Boyle	Mercer	

## SEVENTH DISTRICT

V. G. Kinnaird, Lancaster, Councilor

Casey	Lincoln	Rockcastle
Clinton	McCreary	Russell
Garrard	Pulaski	Wayne

## EIGHTH DISTRICT

C. W. Shaw, Alexandria, Councilor

Boone	Grant	Pendleton
Bracken	Harrison	
Campbell	Mason	Robertson
Kenton	Nicholas	
Fleming		

## NINTH DISTRICT

S. C. Smith, Ashland, Councilor	
Greenup	Martin
Johnson	Magoffin
Lewis	Like
Lawrence	

## TENTH DISTRICT

C. A. Vance, Lexington, Councilor	
Lee	Kowan
Madison	Scott
Menifee	Wolfe
Montgomery	Estill
Powell	Woodford
Morgan	

## ELEVENTH DISTRICT

W. M. Martin, Harlan, Councilor	
Knott	Leslie
Knox	Owsley
Laurel	Perry
Letcher	Whitley

# CONSTITUTION AND BY-LAWS OF THE KENTUCKY STATE MEDICAL ASSOCIATION ADOPTED AT PADUCAH IN 1902 AS AMENDED

## CONSTITUTION

## ARTICLE I.—NAME OF THE ASSOCIATION

The name and title of this organization shall be the Kentucky State Medical Association.

## ARTICLE II.—PURPOSE OF THE ASSOCIATION

The purpose of the Association shall be to federate and bring into compact organization the entire medical profession of the State of Kentucky, and to unite with similar associations in other states to form the American Medical Association, with a view to the extension of medical knowledge, and to the advancement of medical science to the elevation of the standard of medical education, and to the enactment and enforcement of just medical laws; to the promotion of friendly intercourse among physicians, and to the guarding and fostering of their material interest and to the enlightenment and direction of public opinion in regard to the great problem of state medicine, so that the profession shall become more capable and honorable within itself, and more useful to the public in the prevention and cure of disease, and in prolonging and adding comfort to life.

## ARTICLE III.—COMPONENT SOCIETIES.

Component Societies shall consist of those county medical societies which hold charters from this Association.

## ARTICLE IV.—COMPOSITION OF THE ASSOCIATION

Section 1. This Association shall consist of Members, Delegates and Guests.

Sec. 2.—MEMBERS: The members of this Association shall be the members of the component county medical societies.

Sec. 3.—DELEGATES. Delegates shall be those members who are elected in accordance with this constitution and By-laws to represent their respective component county so-



cieties in the House of Delegates of this Association.

Sec. 4.—GUESTS. Any distinguished physician not a resident of this State may become a guest during any Annual Session upon invitation of the Association or its Council, and shall be accorded the privileges of participating in all of the scientific work of that session.

#### ARTICLE V.—HOUSE OF DELEGATES

The House of Delegates shall be the legislative and business body of the Association, and shall consist of (1) Delegates elected by the component county societies, and (2) *ex-officio*, the officers of the Association as defined in Article VIII, Section 1, of this Constitution.

#### ARTICLE VI.—SECTIONS AND DISTRICT SOCIETIES

The House of Delegates may provide for a division of the scientific work of the Association into appropriate Sections, and for the organization of such Councilor District Societies as will promote the best interest of the profession, such societies to be composed exclusively of members of component county societies.

#### ARTICLE VII.—SESSIONS AND MEETINGS

Section 1. The Association shall hold an Annual Session, during which there shall be held daily not less than two General Meetings, which shall be open to all registered members, delegates and guests.

Sec. 2 The time and place for holding each annual session shall be fixed by the House of Delegates.

#### ARTICLE VIII.—OFFICERS

Section 1. The officers of this Association shall be a President, three Vice-Presidents, a Secretary, a Treasurer, and eleven Councilors.

Sec. 2. The President and Vice-Presidents shall be elected for a term of one year. The Secretary, Treasurer and Councilors shall be elected for terms of five years each, the Councilors being divided into classes so that two shall be elected each year. All of these officers shall serve until their successors are elected and installed.

Sec. 3. The officers of the Association shall be elected by the House of Delegates on the morning of the last day of the Annual Session but no Delegate shall be eligible to any office named in the preceding section, except that of Councilor, and no person shall be elected to any such office who is not in attendance upon the Annual Session, and who has not been a member of the Association for the past two years.

#### ARTICLE IX.—FUNDS AND EXPENSES

Funds for meeting the expenses of the Association shall be arranged for by the House

of Delegates by an equal per capita assessment upon each county society to be fixed by the House of Delegates, by voluntary contribution, and from the profits of its publication. Funds may be appropriated by the House of Delegates to defray the expenses of the Annual Session, for publication and for such other purposes as will promote the welfare of the Association and profession.

#### ARTICLE X.—REFERENDUM

The General Meeting of the Association may, by a two-thirds vote, order a general referendum upon any question pending before the House of Delegates, and the House of Delegates may, by a similar vote of its own members, or after a like vote of the General Meeting, submit any such question to the membership of the Association for a final vote; and if the persons voting shall comprise a majority of all the members, a majority of such vote shall determine the question and be binding upon the House of Delegates.

#### ARTICLE XI.—THE SEAL

The Association shall have a common Seal with power to break, change or renew the same at pleasure.

#### ARTICLE XII. AMENDMENTS

The House of Delegates may amend any article of this Constitution by a two-thirds vote of the delegates registered at that Annual Session, provided that such amendment shall have been presented in open meeting at the previous Annual Session, and that it shall have been sent officially to each component county society at least two months before the session at which final action is to be taken.

#### BY-LAWS

##### CHAPTER I.—MEMBERSHIP

Section 1. All members of the Component County Societies shall be privileged to attend all meetings and take part in all the proceedings of the Annual Session, and shall be eligible to any office within the gift of the Association. PROVIDED, that no physician may become a member of any county society unless he signs and keeps inviolate the following pledge:

I hereby promise upon my honor as a gentlemen that I will not so long as I am a member of the Kentucky State Medical Association practice division of fees in any form; neither by collecting fees from others referring patients to me nor by permitting them to collect my fees for me; nor will I make joint fees with physicians or surgeons referring patients to me for operation or consultation; neither will I in any way, directly or indirectly, compensate anyone referring patients to me nor will I utilize any man as an assistant as a subterfuge for this purpose.

Sec. 2. The name of a physician upon the properly certified roster of members, or list of delegates, of a chartered county society which has paid its annual assessment, shall be *prima facie* evidence of his right to register at the Annual Session in the respective bodies of this Association.

SEC. 3. No persons who are under sentence or suspension or expulsion from any component society of this Association, or whose name has been dropped from its roll of membership shall be entitled to any of the rights or benefits of this Association, nor shall he be permitted to take part in any of its proceedings, until such time as he has been relieved of such liability.

Sec. 4. Each member in attendance at the Annual Session shall enter his name on the registration book, indicating the component society of which he is a member. When his right to membership has been verified by reference to the roster of the society, he shall receive a badge which shall be evidence of his right to all the privileges of membership at that session. No member or delegate shall take part in any of the proceedings of an annual session until he has complied with the provisions of this section.

#### CHAPTER II.—ANNUAL AND SPECIAL SESSION OF THE ASSOCIATION

Section 1. The Association shall hold an annual session, meeting every third year in the city of Louisville, and the other two years at some point in the State fixed at the preceding annual session.

#### CHAPTER III.—GENERAL MEETING

Section 1. The General Meeting shall include all registered members, delegates and guests, who shall have equal rights to participate in the proceedings and discussions; and except guests, to vote on pending questions. Each General Meeting shall be presided over by the President or in his absence or disability or upon his request, by one of the Vice-Presidents. Before it, at such time and place as may have been arranged, shall be delivered the annual address of the President, and the annual orations and the entire time of the sessions as far as may be, shall be devoted to papers and discussion relating to scientific medicine.

Sec. 2. The General Meeting shall have authority to create committees or commissions for scientific investigation of special interest and importance to the profession and public, and to receive and dispose of reports of the same; but any expense in connection therewith must first be approved by the House of Delegates.

SEC. 3. Except by special vote, the order of exercises, papers and discussions as set forth in the official program shall be followed

from day to day until it has been completed.

Sec. 4. No address or paper before the Association, except those of the President and orators shall occupy more than twenty minutes in its delivery; and no member shall speak longer than five minutes, nor more than once on any subject.

Sec. 5. All papers read before the Association shall be its property. Each paper shall be deposited with the Secretary when read and if this is not done it shall not be published.

#### CHAPTER IV.—HOUSE OF DELEGATES

Section 1. The House of Delegates shall meet annually at the time and place of the Annual Session of the Association and shall so fix its hours of meeting as not to conflict with the first General Meeting of the Association, or with the meeting held for the address of the President and the annual orations and so as to give delegates an opportunity to attend the other scientific proceedings and discussions so far as is consistent with their duties. But if the business interests of the association and profession require it may meet in advance or remain in session after the final adjournment of the General Meeting.

Sec. 2. Each component county society shall be entitled to send to the House of Delegates each year one delegate for every twenty-five members, and one for each major fraction thereof, but each county society holding a charter from this Association, which has made its annual report and paid its assessments as provided in this Constitution and By-Laws shall be entitled to one delegate. In case the regularly elected delegate or alternate is unable to attend the annual meeting of the Association, the President of the county society may in writing appoint an alternate, who shall have the rights and privileges of a delegate.

Sec. 3. A majority of the registered delegates shall constitute a quorum and all of the meetings of the House of Delegates shall be open to members of the Association.

Sec. 4. It shall, through its officers, Advisory Council, and otherwise, give diligent attention to and foster the scientific work and spirit of the Association, and shall constantly study and strive to make each Annual Session a stepping stone to further ones of higher interest.

Sec. 5. It shall consider and advise as to the material interest of the profession, and of the public in those important matters wherein it is dependent upon the profession, and shall use its influence to secure and enforce all proper medical and public health legislation, and to diffuse popular information in relation thereto.

Sec. 6. It shall make careful inquiry into



the condition of the profession of each county in the State, and shall have authority to adopt such methods as may be deemed most efficient for building up and increasing the interest in such county societies as already exist and for organizing the profession in counties where societies do not exist. It shall especially and systematically endeavor to promote friendly intercourse between physicians of the same locality and shall continue these efforts until every physician in every county of the State who can be made reputable, has been brought under medical society influence.

Sec. 7. It shall encourage post-graduate work in medical centers as well as home study and research and shall endeavor to have the results of the same utilized and intelligently discussed in the county societies. With these ends in view, five years after the adoption of the By-Laws, no voluntary paper shall be placed upon the annual program nor be heard in the Association which has not first been read in the county society of which the author is a member.

Sec. 8. It shall elect representatives to the House of Delegates of the American Medical Association in accordance with the Constitution and By-Laws of that body in such manner that not more than one-half of the delegates shall be elected in any one year.

Sec. 9. It shall upon application provide and issue charters to county societies organized to conform to the spirit of the Constitution and By-Laws.

Sec. 10. In sparsely settled sections it shall have authority to organize the physicians of two or more counties to be designated by hyphenating the names of two or more counties so as to distinguish them from district and other classes of societies and these societies, when organized and chartered shall be entitled to all the privileges and representation provided herein for county societies, until such counties may be organized separately.

Sec. 11. It may divide the counties of the State into Councilor Districts, and, when the best interests of the Association and profession will be promoted thereby, organize in each district a medical society, to meet midway between the annual session of the Association and members of the chartered county societies and none other shall be members.

When so organized from the presidents of such district societies shall be chosen the Vice-Presidents of this Association and the Presidents of the county societies of the district shall be the Vice-Presidents of such district societies.

Sec. 12. It shall have authority to appoint committees for special purposes from

among members of the Association who are not members of the House of Delegates, and such committee may report to the House of Delegates in person, and may participate in the debate thereon.

Sec. 13. It shall approve all memorials and resolutions issued in the name of the Association before the same shall become effective.

Sec. 14. It shall present a summary of its proceedings to the last General Meeting of each Annual Session, and shall publish the same in the JOURNAL.

#### CHAPTER V.—ELECTIONS OF OFFICERS

Section 1. All elections shall be by secret ballot, and a majority of the votes cast shall be necessary to elect, provided, however, that when there are more than two nominees the nominee receiving the least number of votes on the first ballot shall be dropped and the balloting continue until an election occurs in like manner.

Sec. 2. Any member known to have directly or indirectly solicited votes for, or sought any office within the gift of this Association shall be ineligible for any office for two years.

Sec. 3. The election of officers shall be the first order of business of the House of Delegates after the reading of the minutes on the morning of the last day of the General Session.

Sec. 4. Nominations for President shall be called for by counties.

#### CHAPTER VI.—DUTIES OF OFFICERS

Section 1. The President shall preside at all meetings of the Association and of the House of Delegates; shall appoint all committees not otherwise provided for; shall deliver annual address at such time as may be arranged; shall give a deciding vote in case of a tie, and shall perform such other duties as custom and parliamentary usage may require. He shall be the real head of the profession of the State during his term of office and so far as practicable, shall visit by appointment, the various sections of the State and assist the Councilors in building up the county societies and in making their work more practical and useful.

Sec. 2. The Vice-President shall assist the President in the discharge of his duties. In the event of his death, resignation or removal the Council shall elect one of the Vice-Presidents to succeed him.

Sec. 3. The Treasurer shall give bond for the trust imposed in him whenever the House of Delegates shall deem it requisite. He shall demand and receive all funds due the association, together with the bequests and donations. He shall, under the direction of the

House of Delegates, sell or lease any real estate belonging to the Association and execute the necessary papers, and shall in general subject to such direction, have the care and management of the fiscal affairs of the Association. He shall pay money out of the Treasury only on written order of the President, countersigned by the Secretary; he shall subject his accounts to such examinations as the House of Delegates may order, and he shall annually render an account of his doings and of the state of funds in his hands.

The council shall be the executive body of the House of Delegates and between sessions shall exercise the powers conferred on the House of Delegates by the constitution and By-Laws.

Sec. 4. The Secretary, acting with the Committee on Scientific Work, shall prepare and issue the program for and attend all meetings of the Association and of the House of Delegates and he shall keep minutes of their respective proceedings in separate record books. He shall charge upon his books the assessments against each component county society at the end of the fiscal year; he shall collect and make proper credits for the same, and perform such other duties as may be assigned to him. He shall be custodian of all record books and papers belonging to the Treasurer, and shall keep account of and promptly turn over to the Treasurer all funds of the Association which come into his hands. He shall provide for the registration of the members and delegates at the Annual Sessions. He shall keep a card index register of all the legal practitioners of the State by counties, noting on each his status in relation to his county society and upon request shall transmit a copy of this list to the American Medical Association for publication. In so far as it is in his power he shall use the printed matter, correspondence and influence of his office to aid the Councilors in the organization and improvement of the county societies and in the extension of the power and usefulness of this Association. He shall conduct the official correspondence, notifying members of meetings, officers of their election, and committees of their appointment and duties. He shall act as secretary of the Committee on Scientific Work. He shall be editor of the *KENTUCKY MEDICAL JOURNAL*. He shall employ such assistants as may be ordered by the Council or the House of Delegates. He shall annually make a report of his doings to the House of Delegates.

In order that the Secretary may be enabled to give that amount of time to his duties which will permit of his becoming pro-

ficient it is desirable that he shall receive some compensation. The amount of his salary shall be fixed by the House of Delegates.

#### CHAPTER VII.—COUNCIL

Section 1. The Council shall hold daily meetings during the annual session of the Associations and at such other times as necessity may require, subject to the call of the Chairman or on petition of three Councilors. It shall meet on the last day of the Annual Session of the Association for re-organization and for the outlining of the work for the ensuing year. At this meeting it shall elect a chairman and secretary and it shall keep a permanent record of its proceedings. It shall through its Chairman, make an annual report to the House of Delegates at such time as may be provided, which report shall include an audit of the account of the Secretary and Treasurer and other agents of this Association, and shall also specify the character and cost of all the publications of the Association during the year, and the amounts of all other property belonging to the Association, or under its control, with such suggestions as it may deem necessary. In the event of a vacancy in any office the Council may fill the same until the annual election.

Sec. 2. Each Councilor shall be organizer, peacemaker and censor for his district. He shall visit each county in his district at least once a year for the purpose of organizing component societies where none exist, for inquiring into the condition of the profession and for improving and increasing the zeal of the county societies and their members. He shall make an annual report of his doings, and of the condition of the profession of each county in his district to each Annual Session of the House of Delegates. The necessary traveling expenses incurred by Councilor in the line of his duties herein imposed may be allowed by the House of Delegates upon a proper itemized statement, but this shall not be construed to include his expenses in attending the Annual Session of the Association.

Sec. 3. Collectively the Council shall be the Board of Censors of the Association. It shall consider all questions involving the right and standing of members, whether in relation to other members, to the component societies or to this Association. All questions of an ethical nature brought before the House of Delegates of the General Meeting shall be referred to the Council without discussion. It shall hear and decide all questions of discipline affecting the conduct of members or a county society upon which appeal is taken from the decision of an individual Councilor. Its decision in all such cases shall be final.



Sec. 4. The Council shall have the right to communicate the views of the profession and of the Association in regard to health, sanitation and other important matters to the public and the lay press. Such communications shall be officially signed by the chairman and secretary of the Council, as such.

Sec. 5. The Council shall provide for and superintend the publication and distribution of all proceedings, transactions and memoirs of the Association and shall have authority to appoint such assistants to the editors as it deems necessary. It shall manage and conduct the KENTUCKY MEDICAL JOURNAL, which is the organ of the Association, and all money received by the Journal, the Council or any officer of the Association, shall be paid to the Treasurer of the Association on the first of each month.

Sec. 6. All reports on scientific subjects and all scientific discussions and papers heard before the Association shall be referred to the KENTUCKY MEDICAL JOURNAL for publication. The editor, with the consent of the Councilor for the District in which he resides may curtail or abstract papers or discussions, and the Council may return any paper to its author which it may not consider suitable for publication.

Sec. 7. All commercial exhibits during the annual session shall be within the control and direction of the Council.

#### CHAPTER VIII.—COMMITTEES

Section 1. The standing committees shall be as follows:

A Committee on Scientific Work.

A Committee on Public Money and Legislation.

A Committee on Medical Education.

A Medico-Legal Committee.

A Committee on Arrangements, and such other committees as may be necessary. Such committees shall be elected by the House of Delegates, unless otherwise provided.

Sec. 2. The Committee on Scientific Work shall consist of three members of which the President-elect shall be a member and Chairman, and the Secretary shall be a member and Secretary, and shall determine the character and scope of the scientific proceedings of the Association, subject to the provisions or the instructions of the House of Delegates or of the Association, or to the provisions of the Constitution and By-Laws. Thirty days previous to each annual session it shall prepare and issue a program announcing the order in which papers, discussions and other business shall be presented which shall be adhered to by the Association as nearly as practicable.

Sec. 3. The Committee on Public Policy and Legislation shall consist of three members and the President and Secretary. Under the direction of the House of Delegates it shall represent the Association in securing and enforcing legislation in the interest of the public health and scientific medicine. It shall keep in touch with the profession and public opinions, shall endeavor to shape legislation so as to secure the best results for the whole people, and shall utilize every organized influence in local, state and national affairs and elections. Its work shall be done with dignity becoming a great profession and with that wisdom which will make effective its work and influence. It shall have authority to be heard before the entire Association upon questions of great concern at such times as may be arranged during the annual session.

Sec. 4. The Committee on Arrangements shall consist of the component society in the territory in which the annual session is to be held. It shall by committees of its own selection, provide suitable accommodations for the meeting-places of the Association and of the House of Delegates, and of their respective committees and shall have general charge of all arrangements. Its Chairman shall report an outline of the arrangements to the Secretary for publication in the program and shall make additional announcements during the session as occasion may require.

Sec. 5. The Medico-Legal Committee shall consist of three members, one of whom, the Chairman, shall be elected by the Council for five years, and the Secretary and Treasurer shall be the other two members *ex officio*. This committee shall select and fix the compensation for an attorney, who shall act as General Counsel, and if required, additional local counsel. The Association through this Committee shall defend its members who are in good standing against unjust suits for malpractice.

#### CHAPTER IX.—ASSESSMENTS AND EXPENDITURES.

Section 1.—The assessment of five dollars per capita on the membership of the component societies is hereby made the annual dues of this Association. The Secretary of each county society shall forward its assessment together with its roster of all officers and members, lists of delegates, and list of non-official physicians of the county to the Secretary of this Association on the first day of January in each year.

Sec. 2. Any county society which fails to pay its assessments, or make the report required, on or before the first day of April in each year, shall be held as suspended, and

none of its members or delegates shall be permitted to participate in any of the business or proceedings of the Association or of the House of Delegates until such requirements have been met.

Sec. 3. All motions or resolutions appropriating money shall specify a definite amount, or so much thereof as may be necessary for the purpose indicated, and must be approved by the Council and House of Delegates.

#### CHAPTER X.—RULES OF CONDUCT

The Principles set forth in the Principles of Ethics of the American Medical Association shall govern the conduct of members in their relation to each other and to the public.

#### CHAPTER XI.—RULES OF ORDER.

The deliberations of this Association shall be governed by parliamentary usage as contained in Roberts Rules of Order, unless otherwise determined by a vote of its respective bodies.

#### CHAPTER XII.—COUNTY SOCIETIES

Section 1. All county societies now in affiliation with the State Association or those that may hereafter be organized in this State, which have adopted principles of organization not in conflict with this Constitution and By-Laws shall upon application to the House of Delegates, receive a charter from and become a component part of this Association.

Sec. 2. As rapidly as can be done after the adoption of this Constitution and By-Laws, a medical society shall be organized in every county in the State in which no component society exists, and charters shall be issued thereto.

Sec. 3. Charters shall be issued only upon approval of the House of Delegates and shall be signed by the President and Secretary of this Association. The House of Delegates shall have authority to revoke the charter of any component county society whose actions are in conflict with the letter or spirit of this Constitution and By-Laws.

Sec. 4. Only one component medical society shall be chartered in any county. Where more than one county society exists friendly overtures and concessions shall be made with the aid of the Councilor of the District if necessary and all of the members brought into one organization. In case of failure to unite, an appeal may be made to the Council, which shall decide what action shall be taken.

Sec. 5. Each county society shall judge of the qualifications of its own members, but as such societies are the only portals to this Association, every reputable and legally registered physician who is practicing, or who will agree to practice non-sectarian

medicine shall be entitled to membership. Before a charter is issued to any county society, full and ample notice and opportunity shall be given to every physician in the county to become a member.

Sec. 6. Any physician who may feel aggrieved by the action of the society of the county in refusing him membership, or in suspending or expelling him, shall have the right to appeal to the Council, which, upon a majority vote may permit him to become a member of an adjacent county society.

Sec. 7. In hearing appeals, the Council may admit oral or written evidence as in its judgment will best and most fairly present the facts, but in case of every appeal, both as a board and as individual councilors in district and county work, effort at conciliation and compromise shall precede all such hearings.

Sec. 8. When a member in good standing in a component society moves to another county in the State, his name, upon request, shall be transferred without cost to the roster of the county society into whose jurisdiction he moves.

Sec. 9. A physician living in or near a county line may hold membership in that county most convenient for him to attend, on permission of the society in whose jurisdiction he resides.

Sec. 10. Each county society shall have general direction of the affairs of the profession in the county, and its influence shall be constantly exerted for bettering the scientific, moral and material conditions of every physician in the county; and systematic efforts shall be made by each member, and by the society as a whole, to increase the membership until it embraces every qualified physician in the county.

Sec. 11. Frequent meetings shall be encouraged, and the most attractive programs arranged that are possible. The younger members shall be especially encouraged to do post-graduate and original research work, and to give the society the first benefit of such labors. Official position and other preferences shall be unstintingly given to such members.

Sec. 12. At the time of the annual election of officers each county society shall elect a delegate or delegates to represent it in the House of Delegates of this Association in the proportion of one delegate to each twenty-five members or major fraction thereof, and the secretary of the society shall send a list of such delegates to the Secretary of this Association at least sixty days before the Annual Session.

Sec. 13. The Secretary of each county society shall keep a roster of its members and



a list of the non-affiliated registered physicians of the county, in which shall be shown the full name, address, college and date of graduation, date of license to practice in this State, and such other information as may be deemed necessary. He shall furnish an official report containing such information, upon blanks supplied him for the purpose, to the Secretary of this Association, on the first day of January of each year, or as soon thereafter as possible, and at the same time that the dues accruing from the annual assessment are sent in. In keeping such roster the Secretary shall note any changes in the personnel of the profession by death, or by removal to or from the county, and in making his annual report he shall be certain to account for every physician who has lived in the county during the year.

Sec. 14. The Secretary of each county society shall report to the Kentucky Medical Journal full minutes of each meeting and forward to it all scientific papers and discussions which the society shall consider worthy of publication.

#### CHAPTER XII—AMENDMENTS

These By-Laws may be amended by any Annual Session by a two-thirds vote of all the delegates present at that session, after the amendment has been laid on the table for one day.

### CONSTITUTION AND BY-LAWS FOR COUNTY SOCIETIES

Prepared by the Committee on Organization of the American Medical Association of which the late Dr. J. N. McCormack was Chairman

#### ARTICLE I.—NAME AND TITLE OF THE SOCIETY

The name and title of this organization shall be the \_\_\_\_\_ County Medical Society.

#### ARTICLE II.—PURPOSE OF THE SOCIETY.

The purpose of this society shall be to bring into one organization the physicians of \_\_\_\_\_ County, so that by frequent meetings and full and frank interchange of views they may secure such intelligent unity and harmony in every phase of their labor as will elevate and make effective the opinions of the profession in all scientific, legislative, public health, material and social affairs, to the end that the profession may receive that respect and support within its own ranks and from the community to which its honorable history and great achievements entitle it; and with other county societies to form the \_\_\_\_\_ State Medical Association, and through it, with other state associations, to form and maintain the American Medical Association.

#### ARTICLE III.—ELIGIBILITY.

Every legally registered physician residing and practicing in \_\_\_\_\_ County who is of good moral and professional standing and who does not support or practice, or claim to practice, any exclusive system of medicine, shall be eligible for membership.

#### ARTICLE IV.—MEETINGS

Regular meetings shall be held at such time and place as may be determined by the Society.

Special meetings may be called by the President and shall be called on a written request of five members. A call for a special meeting shall state the object of such meeting, at which no business except that stated in the call shall be transacted.

#### ARTICLE V.—OFFICERS

The officers of this Society shall consist of a President, Vice-President, Secretary, Treasurer, Delegates and Board of three Censors. These officers, except the Delegates and Board of Censors, shall be elected annually. Delegates shall be elected for two years, and in accordance with the constitution and by-laws of the state association. One member of the Board of Censors shall be elected each year to serve for three years, provided that at the first election after the adoption of this constitution one member of the Board shall be elected for one year, one for two, and one for three years.

#### ARTICLE VI.—FUNDS AND EXPENSES

Funds for meeting the expenses of the Society shall be raised by annual dues, special assessments and voluntary contributions. Funds may be appropriated by vote of the Society for such purposes as will promote its welfare and that of the profession.

#### ARTICLE VII.—CHARTER

The Society shall apply to the council of the state association for a charter at the meeting at which this constitution and by-laws is adopted, or as soon thereafter as practicable, and the charter shall be kept by the Secretary.

#### ARTICLE VIII.—INCORPORATION

The Society shall have authority to appoint a Board of Trustees and to provide for articles of incorporation whenever it may deem this necessary.

#### ARTICLE IX.—AMENDMENTS

The Society may amend any article of this constitution by a two-thirds vote of its members at any regular meeting, provided that such amendment or amendments are not in conflict with the laws and regulations of the state association; provided, also, that such amendment shall have been read in open session at a previous regular meeting and shall have been sent by mail to each member ten

days in advance of the meeting at which final action is to be taken.

## BY-LAWS

### CHAPTER I.—MEMBERSHIP

Section 1. The Society shall judge of the qualification of its members, but as it is the only door to the state medical association and to the American Medical Association for physicians within its jurisdiction, every reputed and legally qualified physician of ———— County who does not support or practice, claim to practice, sectarian medicine shall be eligible to membership.

Sec. 2.—A candidate for membership shall make application in writing and shall state his age, his college and date of graduation, the place in which he has practiced, and the date of registration in this state. The application must be accompanied by the admission fee and must be endorsed by two members of this Society. It shall be referred to the Board of Censors, who shall inquire into the standing of the applicant, assure themselves that he or she is duly registered according to the laws of the state, and report at the next regular meeting of this Society. Election shall be by ballot, and two-thirds of the votes of the members present and voting shall be necessary to elect. The application shall be returned to the Secretary, who shall file it for future reference. Applications for membership from rejected candidates shall not be received within six months of such rejection.

Sec. 3.—A physician, accompanying his application with a transfer card from another component county society of this or any state within 60 days of the issuance of said card, shall be admitted without fee on a majority vote of the members present, and without the application being referred to the Board of Censors. Such application may be acted on at the meeting at which it is presented on the vote of three-fourths of the members present, otherwise it shall lie over until the next regular meeting. No annual dues for the current year shall be charged against such members, provided the same have been paid to the Society from which the applicant comes.

Sec. 4. A physician residing in an immediately adjoining county may become a member of this Society in like manner and on the same terms as a physician living in this county, on permission of the county society of the county in which the applicant lives.

Sec. 5. A member in good standing who is free from all indebtedness to this Society, and against whom no charges are pending wishing to withdraw, shall be granted a transfer card. This card shall state the date the member associated himself with this Society, the date of issuance of the card, and

shall be signed by the President and Secretary. It shall be accompanied with a copy of the application presented at the time the member joined the Society, for information to the Society to which the member desires to attach himself.

Sec. 6. All members shall be equally privileged to attend all meetings and take part in all proceedings, and shall be eligible to any office or honor within the gift of the Society so long as they conform to this constitution and by-laws, including the payment of dues. A member who is under sentence of suspension or expulsion shall not be permitted to take part in any of the proceedings or be eligible to any office until relieved of such disability. And, provided further, that none of the privileges of membership shall be extended to any person not a member of this Society except on a majority vote of the Society in regular meeting.

Sec. 7. A member who is guilty of a criminal offense or of gross misconduct either as a physician or as a citizen, or who violates any of the provisions of this constitution and by-laws, shall be liable to censure, suspension or expulsion. Charges against a member must be made in writing and be delivered to the Secretary, who shall immediately furnish a copy to the accused and to the Chairman of the Board of Censors. The Board of Censors shall investigate the charges on their merits, but no action shall be taken by the Board within ten days of the presentation of the charges to the accused, nor before giving the accused and accusers ample opportunity to be heard. The board shall report (1) that the charges are not sustained; or (2) that the charges are sustained and that the accused be (a) censured; (b) suspended for a definite time, or (c) expelled. Censure or suspension shall require a two-thirds vote of the members present and voting and a three-fourths vote of those present and voting shall be required to expel a member. No action shall be taken by the Secretary in such cases until at least six weeks have elapsed since the filing of the charges. A member suspended for a definite time shall be reinstated at the expiration of the time.

Sec. 8. Kindly efforts in the interest of peace, conciliation or reformation, so far as possible and expedient, shall precede the filing of formal charges affecting the character or standing of a member, and the accused shall have opportunity to be heard in his own defense in all trials and proceedings of this nature.

Sec. 9. Members expelled from this Society for any cause shall be eligible for membership after one year from date of expulsion and on the same terms and in like manner as original applicants.



## CHAPTER II.—POWERS AND DUTIES

Section 1. This Society shall have general direction of the affairs of the medical profession of the county, and its influence shall be constantly exerted to better the scientific material and social condition of every physician within its jurisdiction. Systematic efforts shall be made by each member, and by the Society as a whole, to increase the membership until it embraces every reputable physician in the county.

Sec. 2. A meeting shall be held at \_\_\_\_\_ p. m. on the \_\_\_\_\_ in each month (or oftener), \_\_\_\_\_ members shall constitute a quorum.

The officers and committee on program shall profit by experience and by example of other similar societies, and strive to arrange for the most attractive and successful proceedings for each meeting. Crisp papers and discussions and reports of cases shall be arranged for and encouraged, and tedious and profitless proceedings and discussions shall be avoided as far as practicable.

SEC. 3. Agreements and schedules for fees shall not be made by this Society, but at least one meeting during each year shall be set apart for a discussion of the business affairs of the profession of the county, with the view of adopting the best methods for the guidance of all. In all proper ways the public shall be taught that business methods and prompt collections are essential to the equipment of the modern physician and surgeon and that it suffers even more than the profession when this is not recognized.

Sec. 4. This Society shall endeavor to educate its members to the belief that the physician should be a leader in his community, in character, in learning, in dignified and manly bearing, and in courteous and open treatment of his brother physicians, to the end that the profession may occupy that place in its own and the public estimation to which it is entitled.

## CHAPTER III.—OFFICERS.

Section 1. The Officers of the Society shall be elected at the December meeting in each year, which shall be known as the annual meeting. Nominations shall be made by informal ballot, and all elections be by ballot. The vote of the majority of all the members present shall be necessary to an election.

Sec. 2. The President shall preside at the meetings of the Society, and perform such other duties as custom and parliamentary usage may require. He shall be the real head of the profession in the county during the year, and it shall be the pride and ambition to leave it in better condition as regards both scientific attainments and harmony than at the beginning of his term of office.

Sec. 3. The Vice-President shall assist the

President in the performance of his duties, shall preside in his absence, and on his death, resignation or removal from the county, shall succeed to the presidency.

Sec. 4. The Secretary shall record the minutes of the meetings and receive and care for all records and papers belonging to the Society, including its charter. He shall notify each member of the Society as to the time and place of each meeting, and, whenever possible, give the program for the meeting. He shall keep account of and promptly turn over to the Treasurer all funds of the Society which may come into his hands. He shall make and keep a list of the members of this Society in good standing, noting of each his correct name, address, place and date of graduation, and the date of the certificate entitling him to practice medicine in this state; and in a separate list he shall note the same facts in regard to each legally qualified physician in this county not a member of this Society. It shall be his duty to send a copy of such lists, on blank forms furnished him for that purpose, to the Secretary of the state association at such times as may be designated by the state association. In making such lists he shall endeavor to account for each physician who has moved into or out of the county during the year, stating when possible, both his present and past address. At the same time, and with his report of such lists of members and physicians, he shall transmit to the state association his order on the Treasurer for the annual dues of the Society.

Sec. 5. The Treasurer shall receive all dues and money belonging to the Society from the hands of the Secretary or members, and shall pay out the same only on the written order of the President, countersigned by the Secretary.

Sec. 6. The Delegates shall attend and faithfully represent the members of this Society and the profession of this county in the House of Delegates of the state association, and shall make a report of the proceedings of that body to this Society at the earliest opportunity.

## CHAPTER IV.—COMMITTEES

Section 1. There shall be a Board of Censors as provided in the constitution, a Standing Committee on Program and Scientific Work, a Committee on Public Health and Legislation, and such special committees as may from time to time be deemed necessary.

SEC. 2. Board of Censors. This Board shall examine and report on the qualification of applicants for membership subjecting each applicant to such examination as it may deem necessary. It shall investigate charges preferred against a member, and

report its conclusions and recommendations to the Society. In case of the absence of a member of the Board, the President may appoint some member to fill the vacancy. The senior member of the Board in point of service shall be Chairman of the Board.

Sec. 3. Committee on Program and Scientific Work. This Committee shall consist of the President, Vice-President and Secretary. It shall be the duty to promote the scientific and social functions of the Society by arranging attractive programs for each meeting and by urging each member to take part in the scientific work. It shall stimulate fraternalism and good feeling among the members in every way possible. (Provisions should be made in this Section for annual luncheons, dinners, etc., which the Committee believes to be an excellent way to bring members together. Such occasions should be made as inexpensive as possible).

Sec. 4. Committee on Public Health and Legislation. This committee shall consist of three members who shall be appointed annually by the President. It shall be its duty to enforce and support the sanitary and medical laws of the state in this county, to co-operate with the Committee on Public Policy and Legislation of the state association in all matters pertaining to legislation, and to prosecute quacks and medical pretenders in this county.

#### CHAPTER V.—FUNDS AND EXPENSES

Section 1. The admission fee, which must accompany the application, shall be \$—— and shall include the annual dues for the fiscal year. The admission fee shall be returned if the applicant is not accepted.

Sec. 2. The annual dues shall be \$—— and shall be payable on January 1 of each year. Any member who shall fail to pay his annual dues by April 1 shall be held as suspended without action on the part of the Society. A member suspended for non-payment of dues shall be restored to full membership on payment of all indebtedness. Members more than one year in arrears shall be dropped from the roll of members.

Sec. 3. The fiscal year of this Society shall be from January to December, inclusive.

#### CHAPTER VI.—ORDER OF BUSINESS

The order of business shall be as follows:

1. Call to order by the President.
2. Reading of the minutes of last meeting.
3. Clinical cases.
4. Papers and discussions.
5. Unfinished business.
6. Miscellaneous business.
7. Announcements.
8. Adjournment.

#### CHAPTER VII.—RULES OF ORDER

The deliberations of this Society shall be governed by parliamentary usage as con-

tained in Roberts' Rules of Order, unless otherwise determined by vote.

#### CHAPTER VIII.—THE PRINCIPLES OF MEDICAL ETHICS

The Principles of Medical Ethics of the American Medical Association shall govern this Society.

#### CHAPTER IX.—AMENDMENTS

These by-laws may be amended at any regular meeting by a two-thirds vote therefor, provided that such amendment has been read in open session at the preceding regular meeting and a copy of the same has been sent to each member by the Secretary ten days in advance of the meeting at which final action is to be taken.

#### REPORT OF BUSINESS MANAGER

To the House of Delegates:

With the publication of this issue of the JOURNAL, all the material from the members of the association has been published. This includes papers read before County Medical and District Societies, Special Articles, the Verbatim Proceedings of the House of Delegates, and the Scientific Sessions, papers and full proceedings of the Eye, Ear, Nose and Throat Section. By using a better and heavier quality of paper for the outside covers, the JOURNAL has improved in appearance and make up, and through the loyal support our profession has given our advertisers we have been able to publish this year a larger and better JOURNAL without any expense to the Association. In fact, a small profit has been made.

The following figures give in detail a report of the contents of the JOURNAL for two years:

	1931	1932
Editorials .....	65	68
Scientific Editorials .....	7	5
Official Announcements.....	10	17
Original Articles.....	114	181
County Society Reports.....	49	64
Book Reviews .....	41	50
Pages Reading Matter.....	628	767
Pages Advertisements.....	356	328

#### COMMERCIAL EXHIBITS

All the available space has been sold for our commercial exhibits and only those products that have been approved by the American Medical Association are accepted. This department will be located in the lobby of the Brown Hotel Roof Garden, and a few hours spent among these exhibits is equal to a real post graduate course.

Our advertisers have shown their appreciation of the value of the JOURNAL as an advertising medium by increasing their space in many instances, and have not curtailed this department and they will continue to seek the pages of the JOURNAL only so long as our readers patronize them.



The fiscal year of the JOURNAL closes without red figures and our membership has not decreased, and the loyalty and courage of our physicians is without parallel in any other profession, and if this unselfish devotion was emulated in other fields a brighter future would dawn upon our poverty stricken country.

L. H. SOUTH, M. D.

### AUDITOR'S REPORT

TO THE COUNCIL OF THE KENTUCKY STATE MEDICAL ASSOCIATION:

Gentlemen:

Upon request, I have made a complete audit of the books and accounts of your Secretary, Dr. A. T. McCormack, and your Treasurer, Dr. M. McDowell, for the period beginning September 1, 1931, and ending August 31, 1932.

All receipts were properly accounted for and every disbursement was charged to the proper account, being in the form of a voucher check signed by the proper officers and bearing the endorsement of the payee.

The exhibits herewith submitted set forth in detail the financial transactions from every angle and show the true condition of your affairs at this date. Your records are correctly and neatly kept.

I have also checked the receipts and disbursements of the Treasurer, Miss Pauline C. Haley of the Woman's Auxiliary to the Kentucky State Medical Association, and Mrs. Edna R. Krieger, Business Manager of "The Quarterly," Supplement to The Kentucky Medical Journal, and find them correct as set forth in the schedules submitted herewith.

Respectfully,

B. P. EUBANK.

Reconciliation of Treasurer's accounts for period September 1, 1931, to September 1, 1932, viz:

Balance on hand at last report .....\$10,672.82  
Less Vouchers then outstanding ..... 3,586.18

Balance agreeing with Secretary's last report ..... \* 7,086.64  
Amount received from Secretary for period ..... 17,019.31  
Amount received from interest on Bonds and Savings ..... 136.67 17,155.98  
Total ..... \$24,242.62

### DISBURSEMENTS

Expense .....\$16,652.77  
Balance, Sept. 1, 1932, checking account .....\$ 7,453.18  
Additional Balance Sept. 1, 1932, in Savings Account ..... 136.67 7,589.85 \$24,242.62

Balance Sept. 1, 1932..Checking Acct.....\$ 7,453.18

Reconciliation:  
Balance in the National Bank of Cynthiana  
Cynthiana, Kv. Treasurer's Account \$ 9,591.64  
Vouchers outstanding, viz:

No. 130, July 31, 1930,  
Louis Visman.....\$ 20.10  
No. 100, Mar 29, 1932,  
Clarence Neighbors, P. M.. 51.00  
No. 112, July 30, 1932  
A. T. McCormack, M.D... 135.00

No. 113, July 30, 1932  
L. H. South, M. D. .... 108.33  
No. 114, July 30,, 1932  
J. F. Blackerby ..... 90.00  
No. 115, July 30, 1932  
Elva Grant ..... 75.00  
No. 116, July 30, 1932  
L. R. Curtis, Attorney .. 254.48  
No. 116-A, July 30, 1932  
Craft & Stannill ..... 75.00  
No. 117, July 30, 1932,  
Ruth Flagg ..... 1.94  
No. 118, July 30, 1932,  
Rebecca R. Cassell..... 7.56  
No. 118-A, July 30, 1932,  
Mayme Sullivan ..... 3.92  
No. 119, July 30, 1932,  
Bush-Krebs Company .. 3.96  
No. 120, July 30, 1932,  
Kentucky Book Mfg. Co.. 10.00  
No. 121, July 30, 1932  
Woman's Auxiliary to the  
Ky. State Med. Ass'n.... 19.91  
No. 122, July 30, 1932,  
Times Journal Pub. Co., 193.26  
No. 123, Aug. 31, 1932,  
A. T. McCormack, M. D. 135.00  
No. 124, Aug. 31, 1932,  
L. H. South, M. D. .... 90.00  
No. 125, Aug. 31, 1932,  
J. F. Blackerby ..... 90.00  
No. 126, Aug. 31, 1932,  
Elva Grant ..... 75.00  
No. 127, Aug. 31, 1932,  
Times-Journal Pub. Co... 400.00 2,138.46

Balance agreeing with Secretary .....\$7,453.18  
Vouchers Nos. 123, 124,  
125, 126, 127 are in the  
hands of the Secretary  
to be delivered.

### STATEMENT OF ASSETS

Balance in the National Bank of  
Cynthiana, Cynthiana, Kentucky, to  
the credit of the Kentucky State  
Medical Association, M. McDowell,  
M. D., Treasurer (Checking Ac-  
count) .....\$ 9,591.64  
Less vouchers outstanding ..... 2,138.46  
\$ 7,453.18  
Savings Account .....\$6,687.61  
Interest on Bonds ..... 55.00  
Interest on Savings ..... 231.67  
231.67

Total .....\$6,974.28  
Less Coupons returned from  
1931 ..... 150.00 6,824.28

Kentucky State Med. Ass'n.  
Student Loan Fund Acct. 19.28  
Interest on Loan Fund 1.94 21.22

Total amount in Bank .....\$14,298.68  
Louisville Title Bonds Nos. 3, 5, 8,  
13, 40, at \$1,000.00 each, in hands  
of Treasurer deposited in the Na-  
tional Bank of Cynthiana, Cynthiana,  
Kentucky .....\$5,000.00  
Office Furniture, etc. (See Ex-  
hibit "D") ..... 915.97 5,915.97

Total .....\$20,214.65

### EXHIBIT "A"

#### RECEIPTS

Dues from County Societies .....\$ 8,618.50  
Income of Journal (Exclusive of In-  
vestments, etc.) ..... 8,400.81  
Student Loan Fund ..... 21.22  
Interest on Savings Account..\$231.67  
Interest on Louisville Title  
Bonds Nos. 3, 5, 8, 13 and 40 55.00  
286.67

Less returned coupons on in-  
terest on Louisville Title  
Bonds Nos. 3, 5, 8, 13 and  
40, credited on last report ...\$150.00 136.67

Total Receipts .....\$17,177.20  
Balance on hand, September 1, 1931,  
Checking Account ..... 7,086.64  
Balance on hand, September 1, 1931,  
Savings Account ..... 6,687.61

Total .....\$30,951.45

#### DISBURSEMENTS

STATE MEDICAL ASSOCIATION:  
President's Sundries .....\$ 6.50  
Secretary's Salary ..... 1,725.00  
Secretary's Stenographer's Salary... 900.00  
Secretary's Sundries ..... 884.32  
Treasurer's Bond and Expense ..... 12.50  
Officers', Councilors' and Committee  
Expenses ..... 324.56

Committee on Public Policy Expense	1,150.00
Practice Act, Medical Enforcement	300.00
Attorneys' Fees, Medico-Legal Committee	1,129.48
Costs and Expenses, Medico-Legal Committee	19.00
Association Sundries	121.80
Post Graduate Course Expense	41.00
Louisville Meeting Expense	26.26
Lexington Meeting Expense	1,675.19
Eye, Ear, Nose and Throat Section Expense	73.50
Federal Tax on Checks	.20
Total State Medical Association	\$ 8,389.31
<b>KENTUCKY MEDICAL JOURNAL</b>	
Business Manager's Salary	\$ 1,150.00
Business Manager's Sundries	69.13
Journal Advertisement Collections	
Paid Woman's Auxiliary, Kentucky State Medical Association	19.91
Journal, Printing	6,168.78
Journal, Postage	175.00
Journal, Sundries	680.64
Total, Journal	\$ 8,263.46
Grand Total	\$16,652.77
Balance on hand this date, Checking Account	\$ 7,453.18
Balance on hand this date, Savings Account	6,824.28
Balance on hand, Student Loan Fund	21.22
Total	\$30,951.45

### EXHIBIT "B" STUDENT LOAN FUND

1930	
Sept. 1 Total Receipts on hand	\$ 264.00
1931	
Jan. 1 Interest	5.28
Total	\$ 269.28
Feb. 10 Loan for Medical Education	250.00
Sept. 1 Balance on hand	\$ 19.28
1932	
July 5, Interest	1.94
Balance on hand	\$21.22

### EXHIBIT "C"

Detailed list of receipts from County Societies from September, 1931, to September, 1932, compared with incomes of same period last year:

	1931	1932
Adair	\$ 65.00	\$ 35.00
Allen	45.00	40.00
Anderson	45.00	45.00
Ballard	35.00	30.00
Barren	80.00	70.00
Bath	50.00	45.00
Bell	135.00	100.00
Boone	15.00	5.00
Bourbon	75.00	80.00
Boyd	240.00	215.00
Boyle	55.00	55.00
Bracken	50.00	40.00
Breathitt	45.00	35.00
Breckenridge	45.00	30.00
Bullitt	30.00	30.00
Butler	15.00	15.00
Caldwell	45.00	45.00
Calloway	85.00	75.00
Campbell-Kenton	570.00	580.00
Carlisle	30.00	35.00
Carroll	35.00	40.00
Carter	50.00	35.00
Casey	25.00	15.00
Christian	160.00	155.00
Clark	95.00	90.00
Clay	35.00	30.00
Clinton	15.00	15.00
Crittenden	35.00	20.00
Cumberland	30.00	30.00
Daviess	195.00	210.00
Elliott		5.00
Estill	25.00	25.00
Fayette	480.00	530.00
Fleming	65.00	60.00
Floyd	30.00	40.00
Franklin	75.00	75.00
Fulton	65.00	40.00
Gallatin		15.00
Garard	20.00	30.00
Grant	15.00	85.00
Graves	125.00	105.00
Grayson	50.00	30.00
Green	30.00	25.00
Greenup	45.00	55.00
Hancock		

Hardin	100.00	110.00
Harlan	215.00	225.00
Harrison	85.00	80.00
Hart	30.00	45.00
Henderson	85.00	80.00
Henry	40.00	25.00
Hickman	30.00	35.00
Hopkins	80.00	95.00
Jackson	10.00	10.00
Jefferson	2,012.50	1,923.50
Jessamine	55.00	60.00
Johnson	50.00	35.00
Knott	5.00	10.00
Knox	50.00	50.00
Larue	30.00	40.00
Laurel	40.00	40.00
Lawrence	50.00	55.00
Lee	10.00	10.00
Leslie	5.00	5.00
Letcher	25.00	115.00
Lewis	20.00	20.00
Lincoln	50.00	45.00
Livingston	25.00	20.00
Logan	85.00	60.00
Lyon	20.00	20.00
McCracken	225.00	225.00
McCreary	45.00	50.00
McLean	30.00	30.00
Madison	135.00	150.00
Magoffin	10.00	5.00
Marion	50.00	55.00
Marshall	55.00	45.00
Martin		10.00
Mason	95.00	100.00
Meade	5.00	5.00
Menefee		
Mercer	55.00	55.00
Metcalfe	25.00	25.00
Monroe	25.00	15.00
Montgomery	45.00	65.00
Morgan	15.00	10.00
Muhlenberg	105.00	80.00
Nelson	45.00	50.00
Nicholas	50.00	50.00
Ohio	35.00	30.00
Oldham	20.00	30.00
Owen	20.00	20.00
Owsley	20.00	20.00
Pendleton	35.00	30.00
Perry	140.00	170.00
Pike	100.00	105.00
Powell	10.00	
Pulaski	70.00	80.00
Robertson	10.00	10.00
Rockcastle	20.00	45.00
Rowan	5.00	10.00
Russell	30.00	20.00
Scott	65.00	65.00
Shelby	75.00	85.00
Simpson	45.00	55.00
Spencer	15.00	
Taylor	45.00	40.00
Todd	35.00	35.00
Trigg	30.00	15.00
Trimble		
Union	60.00	20.00
Warren-Edmonson	140.00	135.00
Washington	35.00	35.00
Wayne	5.00	20.00
Webster	40.00	20.00
Whitley	100.00	80.00
Wolfe	10.00	5.00
Woodford	45.00	40.00

Total	\$8,947.50	\$8,823.50
Less Campbell-Kenton County		
Check returned (Bank closed)	\$ 205.00	
Total	\$8,618.50	

### EXHIBIT "D"

Invoice of the Property of the Association, September 1, 1932.

5,000 Addressograph Plates, completely addressed	\$300.00
1 Remington Typewriter	25.00
1 Desk	50.00
1 Typewriter Chair	9.00
1 Filing Cabinet	64.75
Rubber Stamps	9.00
Guide Cards	5.00
1-3 Adding Machine	75.00
1 Electric Fan	18.00
1 Globe Safe with Fixtures	130.00
2 Cabinets for Addressograph, 36 drawers each,	
@ \$45.00	90.00
2 Cabinets for Addressograph, 18 drawers each,	
@ 30.00	60.00
1 Cabinet for Addressograph, 9 drawers each,	
@ \$15.00	15.00
64 Drawers @ 95c each	60.80
Total	\$911.55
95% Reduction for Depreciation	865.95



Total Old Property .....	\$ 45.60
29 Bound Volumes Kentucky Medical Journals, 1903-1931 .....	290.00
1 N. F. Q. Addressograph and Ejector .....	\$285.00
Less 40% Depreciation .....	\$114.00
1 Underwood Typewriter .....	83.03
Less 20% Depreciation .....	16.60
4,000 No. 5 2-cent envelopes, plain @ \$21.60 per M .....	86.40
750 No. 8 2-cent envelopes, plain, @ \$2.34 per M .....	16.75
500 No. 5 2-cent envelopes Ky. State Medical Asso- ciation @ \$21.60 per M .....	10.80
10,250 No. 8 2-cent envelopes, Ky. State Medical Association, @ 22.34 per M .....	228.99
Total .....	\$915.97

## EXHIBIT "E"

Secretary's Monthly Balance Sheet, Agree-  
ing With Books.

1931			
Sept. 1—Balance on hand .....	\$ 7,086.64		
Expenses .....		Balance	
Oct. 1 .....	\$ 3,449.11	\$ 1,667.12	\$ 5,304.65
Nov. 1 .....	1,833.60	1,700.69	5,171.74
Dec. 1 .....	1,390.79	586.03	4,366.98
1932			
Jan. 1 .....	1,003.22	464.80	3,828.56
Feb. 1 .....	1,231.81	2,890.52	5,487.27
March 1 .....	1,038.20	1,468.57	5,917.64
April 1 .....	1,106.87	1,759.67	6,550.44
May 1 .....	1,353.43	4,058.00	9,255.01
June 1 .....	1,131.90	647.23	8,770.34
July 1 .....	1,025.28	939.13	8,684.19
Aug. 1 .....	1,278.36	837.55	8,243.38
Sept. 1 .....	790.00		7,453.38
Tax on Checks .....	.20		7,453.18
	\$16,652.77	\$17,019.31	
Balance on hand September 1, 1931 .....	\$ 7,086.64		\$24,105.95
Balance on hand, September 1, 1932 .....		7,453.18	
Total Expenses .....	\$16,652.77		\$24,105.95

## EXHIBIT "F"

Collections by Secretary on account of  
Kentucky State Medical Association, corre-  
sponding with checks, deposit slips and re-  
ceipts filed.

1931			
Oct. 1—To Collections to date .....	\$ 340.00		
Nov. 1—To Collections to date .....	90.00		
Dec. 1—To Collections to date .....	18.50		
1932			
Jan. 1—To Collections to date .....	20.00		
Feb. 1—To Collections to date .....	1,587.50		
Mar. 1—To Collections to date .....	995.00		
April 1—To Collections to date .....	1,225.00		
May 1—To Collections to date .....	3,635.00		
June 1—To Collections to date .....	242.50		
July 1—To Collections to date .....	320.00		
Aug. 1—To Collections to date .....	145.00		
Total for year .....	\$8,618.50		

## EXHIBIT "G"

Collections by Editor on account of The  
Journal, corresponding with checks, deposit  
slips and receipts filed.

1931			
Oct. 1—To Collections to date .....	\$1,327.12		
Nov. 1—To Collections to date .....	1,610.69		
Dec. 1—To Collections to date .....	567.53		
1932			
Jan. 1—To Collections to date .....	444.80		
Feb. 1—To Collections to date .....	1,303.02		
Mar. 1—To Collections to date .....	473.57		
April 1—To Collections to date .....	1,534.67		
May 1—To Collections to date .....	423.00		
June 1—To Collections to date .....	404.73		
July 1—To Collections to date .....	619.13		
Aug. 1—To Collections to date .....	692.55		
Total for Year .....	\$8,400.81		

## EXHIBIT "H"

Total membership by Councilor Districts  
and by Counties for 1932 as compared to that  
of 1931.

First District—V. A. Stilley, Benton, Councilor.			
1931		1932	
Ballard .....	7	6	
Caldwell .....	9	8	
Calloway .....	17	15	
Carlisle .....	6	7	
Crittenden .....	7	4	
Fulton .....	13	8	
Graves .....	25	21	
Hickman .....	6	7	
Livingston .....	5	4	
Lyon .....	4	4	
Marshall .....	11	9	
McCracken .....	45	45	
Trigg .....	6	1	
	161	139	
Second District—D. M. Griffith, Owensboro, Councilor.			
Daviess .....	37	38	
Hancock .....	..	..	
Henderson .....	16	16	
Hopkins .....	14	18	
McLean .....	5	6	
Muhlenberg .....	19	15	
Ohio .....	6	6	
Union .....	12	4	
Webster .....	7	4	
	116	107	
Third District, C. C. Howard, Glasgow, Councilor.			
Allen .....	9	8	
Barren .....	16	14	
Butler .....	3	3	
Christian .....	32	31	
Cumberland .....	6	6	
Logan .....	17	12	
Metcalfe .....	5	5	
Monroe .....	4	2	
Simpson .....	9	10	
Todd .....	7	7	
Warren-Edmonson .....	22	24	
	130	123	
Fourth District—J. I. Greenwell, New Haven, Councilor.			
Breckenridge .....	9	6	
Bullitt .....	5	5	
Grayson .....	9	6	
Lardin .....	20	22	
Hart .....	6	8	
Larue .....	6	7	
Meade .....	1	1	
Nelson .....	9	10	
Spencer .....	1	..	
	66	65	
Fifth District—W. E. Gardner, Louisville, Councilor.			
Carroll .....	7	8	
Franklin .....	15	14	
Gallatin .....	3	3	
Henry .....	8	5	
Jefferson .....	382	358	
Oldham .....	4	6	
Owen .....	3	4	
Shelby .....	15	17	
Trimble .....	..	..	
	434	415	
Sixth District—R. C. McChord, Lebanon, Councilor.			
Adair .....	6	7	
Anderson .....	9	9	
Boyle .....	11	11	
Green .....	6	5	
Marion .....	10	11	
Mercer .....	11	11	
Taylor .....	9	8	
Washington .....	7	7	
	69	69	
Seventh District—V. G. Kinnaird, Lancaster, Councilor.			
Casey .....	4	4	
Clinton .....	3	3	
Garrard .....	6	6	
Lincoln .....	10	9	
McCreary .....	9	10	
Pulaski .....	13	14	
Rockcastle .....	4	5	
Russell .....	6	4	
Wayne .....	1	3	
	56	57	
Eighth District—C. W. Shaw, Alexandria, Councilor.			
Boone .....	3	1	
Bracken .....	9	8	
Campbell-Kenton .....	106	106	
Fleming .....	13	12	
Grant .....	3	12	

Harrison	17	16	Jessamine	11	11
Mason	18	19	Lee	2	2
Nicholas	10	10	Madison	27	29
Pendleton	7	6	Menifee	..	..
Robertson	2	2	Montgomery	9	11
	188	192	Morgan	3	2
Ninth District—S. C. Smith, Ashland, Councilor.					
Boyd	46	41	Powell	2	..
Carter	9	7	Rowan	1	2
Elliott	..	1	Scott	13	18
Floyd	6	8	Wolfe	2	1
Greenup	7	10	Woodford	9	8
Johnson	10	7		227	231
Lawrence	10	10	Eleventh District—W. M. Martin, Harlan, Councilor.		
Lewis	4	10	Bell	25	20
Magoffin	2	2	Clay	7	6
Martin	..	1	Harlan	40	41
Pike	18	19	Jackson	2	1
	112	109	Knott	1	..
Tenth District—C. A. Vance, Lexington, Councilor.					
Bath	9	8	Knox	10	10
Bourbon	15	15	Laurel	8	8
Breathitt	8	7	Leslie	1	1
Clark	19	17	Letcher	5	18
Estill	5	5	Owsley	4	4
Fayette	92	100	Perry	28	31
			Whitley	20	16
				151	156

## EXHIBIT "I"

Detailed Statement of Disbursements of Marshall McDowell, M. D., Treasurer, Kentucky State Medical Association, each made on a Voucher Check, signed by J. T. Reddick, M. D., President; A. T. McCormack, M. D., Secretary, and himself from September 1, 1931, to September 1, 1932.

1931		
Sept. 30—Voucher Check No. 1		\$ 492.50
A. T. McCORMACK, M. D., Louisville.		
To September salary, Secretary	\$150.00	
To expense	325.00	
To expense, State Meeting, Lexington	17.50	
	492.50	
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 2		110.00
L. H. SOUTH, M. D., Louisville.		
To September salary, Business Manager	100.00	
To expense to Crab Orchard and Mt. Vernon and return	10.00	
	110.00	
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 3		100.00
J. F. BLACKERBY, Louisville.		
To September services rendered Committee on Public Policy.		
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 4		143.95
ELVA GRANT, Louisville.		
To September salary, Bookkeeper	75.00	
To honorarium	25.00	
To expense, State Meeting, Lexington	13.95	
To expense, State Meeting, 6 Pages @ \$5.00 each	30.00	
	148.95	
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 5		30.50
C. A. VANCE, M. D., Lexington.		
To expense as Councilor, 10th District.		
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 6		24.98
S. C. SMITH, M. D., Ashland.		
To expense as Councilor, 9th District.		
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 7		58.50
B. P. EUBANK, Bowling Green.		
To auditing books and accounts of A. T. McCormack, M. D., Secretary, and Marshall McDowell, M. D., Treasurer, and Mrs. W. C. Dugan Treasurer, Woman's Auxiliary, for period September 1, 1930, to September 1, 1931	50.00	
To railroad fare, Bowling Green to Louisville and return, and three meals	8.80	
	58.80	
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 8		5.00
GRAHAM & LONGSTREET, Louisville.		
To 1 day's attendance and reporting case Lizzie Shawley vs. Wallace Frank, M. D.		
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 9		8.70
STEPHENS & STEELY, Williamsburg.		
To court costs in case of J. W. Brown vs. S. S. Brown, M. D.		
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 10		150.00
HUFFAKER, HOGAN & BERRY, Louisville.		
To legal services rendered in case Shawley, etc. vs. Wallace Frank, M. D.		



Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 11 .....	15.75
ELECTRIC BLUE PRINT & SUPPLY CO., Louisville.	
To 300 Prints, Floor Plan for State Meeting Lexington.	
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 12 .....	52.00
AMERICAN MEDICAL ASSOCIATION, Chicago.	
To 12th Edition, American Medical Directory .....	
To one single column cut and 2,500 inserts of Dr. James T.	
Reddick's picture .....	
	12.00
	40.00
	52.00
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 13 .....	331.04
F. & V. MANUFACTURING CO., East Providence, R. I.	
To 1,000 Emblem Buttons @ 25 cents each .....	
To 500 Bangles "Lexington 1931" @ 16c ea. ....	
Insured mail .....	
	250.00
	80.00
	1.04
	331.04
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 14 .....	1.50
LOUISVILLE TAXICAB & TRANSFER CO., Louisville.	
To hauling 18 boxes from Kentucky State Medical Association	
office to City Hospital and return during Post Graduate	
Course .....	
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 15 .....	99.95
BUSH-KREBS COMPANY, Louisville.	
To 25 cuts for Annual Number .....	
To 1 cut for Dr. K. A. Fischer's paper .....	
	96.12
	3.83
	99.95
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 16 .....	6.35
MEFFERT EQUIPMENT COMPANY, Louisville	
To 3-M 4x6 No. 1 White Cards .....	
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 17 .....	\$ 159.50
TIMES-JOURNAL PUBLISHING COMPANY,	
To 250 Commercial Exhibits .....	
To 250 Applications for Space .....	
To 500 Letterheads and 500 Envelopes, Eye, Ear, Nose and	
Throat Section .....	
To 5,000 Billheads .....	
To 700 Annual Programs, 40 Pages .....	
To 500 Reprints—University of Kentucky .....	
	6.25
	7.25
	6.50
	15.00
	122.00
	2.50
	159.50
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 18 .....	556.64
TIMES-JOURNAL PUBLISHING COMPANY, Bowling Green.	
To 2,300 88-Page August Issue .....	
Less Credit by Check No. 133 .....	
To 2,500 100-Page Sept. Issue .....	
Less Credit by Check No. 139 .....	
	563.06
	350.00
	213.06
	693.58
	350.00
	343.58
	556.64
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 19 .....	20.00
UNIVERSITY OF KENTUCKY, Lexington.	
To room for 5 assistants attending State Meeting at Lexington,	
@ \$4.00 each .....	
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 20 .....	15.00
E. H. ROEDERER, Louisville.	
To 200 Delegate Badges .....	
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 21 .....	70.00
MAYME SULLIVAN, Louisville.	
To Honorarium .....	
To expense, State Meeting, Lexington .....	
To expense for Baggage, Express, Watchman & Janitor .....	
	25.00
	14.05
	30.95
	70.00
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 22 .....	38.80
REBECCA CASSELL, Louisville.	
To Honorarium .....	
To expense, State Meeting, Lexington .....	
	25.00
	13.80
	38.80
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 23 .....	32.80
RUTH FLAGG, Louisville.	
To Honorarium .....	
To expense, State Meeting, Lexington .....	
	25.00
	7.80
	32.80
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 24 .....	39.40
EMILY STOECKER, Louisville.	
To Honorarium .....	
To Expense, State Meeting, Lexington .....	
	25.00
	14.00
	39.40
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 25 .....	25.00
J. G. OWSLEY, M. D., Lily.	
To Honorarium .....	
Approved by Council and Ordered Paid by House of Delegates.	

Sept. 30—Voucher Check No. 26	671.95
MASTER REPORTING COMPANY, Chicago.	
To reporting Annual Meeting of Kentucky State Medical Association, Lexington:	
House of Delegates	147.90
Scientific Session	169.15
Public Meeting	54.40
Eye, Ear, Nose and Throat Section	97.30
Abridging 9 Sessions	90.00
Traveling Expenses for 2 Persons	113.20
	<u>671.95</u>
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 27	155.00
COUNTRY CLUB, Lexington.	
To 125 Dinners for Woman's Auxiliary Annual Dinner.	
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 28	21.50
C. C. HOWARD, M. D., Glasgow.	
To part expense as Councilor of Third District.	
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 29	12.50
RAMSEY SIGN SERVICE CO., Lexington.	
To hanging 3 street banners for State Meeting, Lexington.	
Approved by Council and Ordered Paid by House of Delegates.	
Oct. 31—Voucher Check No. 30	604.68
TIMES-JOURNAL PUBLISHING COMPANY, Bowling Green.	
To 2,300 84-Page October Issue	541.98
Less personal telephone	1.80
	<u>540.18</u>
To 1200 Letterheads	45.00
To 500 Letterheads and 500 Envs.—Dr. Barbour	6.50
To 500 Letterheads and 500 Envs.—Dr. Vance	6.50
To 500 Letterheads and 500 Envs.—Dr. Reasor	6.50
	<u>64.50</u>
	<u>604.68</u>
Oct. 31—Voucher Check No. 31	275.00
A. T. McCORMACK, M. D., Louisville.	
To October salary, Secretary	150.00
To expense for K. S. M. A.	125.00
	<u>275.00</u>
Oct. 31—Voucher Check No. 32	140.80
L. H. SOUTH, M. D., Louisville.	
To October salary, Business Manager	100.00
To expense, State Meeting, Lexington	40.80
	<u>140.80</u>
Oct. 31—Voucher Check No. 33	100.00
J. F. BLACKERBY, Louisville.	
To October services rendered Committee on Public Policy	
Oct. 31—Voucher Check No. 34	75.00
ELVA GRANT, Louisville.	
To October salary, Bookkeeper.	
Oct. 31—Voucher Check No. 35	35.00
V. A. STILLLEY, M. D., Benton.	
To expense as Councilor, First District.	
Oct. 31—Voucher Check No. 36	20.42
D. M. GRIFFITH, M. D., Owensboro.	
To expense as Councilor, Second District.	
Oct. 31—Voucher Check No. 37	27.00
W. M. MARTIN, M. D., Harlan.	
To expense as Councilor, Eleventh District.	
Oct. 31—Voucher Check No. 38	12.50
SAMUEL D. HINES & CO., Bowling Green.	
To premium on Bond for Treasurer, Marshall McDowell M. D., for 1 year.	
Oct. 31—Voucher Check No. 39	9.00
WILL DUNN DRUG COMPANY, Lexington.	
To 24 Decks Playing Cards for Woman's Auxiliary Annual Dinner at State Meeting.	
Oct. 31—Voucher Check No. 40	7.00
LEXINGTON COUNTRY CLUB, Lexington.	
To 7 Guest Fees for Woman's Auxiliary Dinner	
Oct. 31—Voucher Check No. 41	25.00
WM. J. RUEFF, Louisville.	
To 2 3'x12' Canvas Banners.	
Oct. 31—Voucher Check No. 42	5.00
KOEHLER STAMP & STENCIL COMPANY, Louisville.	
To 2 Signature Stamps and Cut.	
Oct. 31—Voucher Check No. 43	25.00
KENTUCKY DIVISION, WHITE HOUSE CONFERENCE, Wilmore.	
To promoting Work of White House Conference on Child Health and Protection.	
Oct. 31—Voucher Check No. 44	472.20
TIMES-JOURNAL PUBLISHING COMPANY, Bowling Green.	
To 2,300 72-Page November Issue	472.20
Nov. 30—Voucher Check No. 45	286.59
A. T. McCORMACK, M. D., Louisville.	
To November salary, Secretary	150.00
To expense, Meeting of State Secretaries, Chicago	60.69
Less amount paid by American Medical Association	49.10
	<u>11.59</u>
To general expense	<u>125.00</u> 136.59
Nov. 30—Voucher Check No. 46	100.00
L. H. SOUTH, M. D., Louisville.	
To November salary, Business Manager.	
Nov. 30—Voucher Check No. 47	100.00
J. F. BLACKERBY, Louisville.	
To November services rendered Committee on Public Policy.	



Nov. 30—Voucher Check No. 48	75.00
ELVA GRANT, Louisville.	
To November salary, Bookkeeper.	
Nov. 30—Voucher Check No. 49	100.00
L. B. HANDLEY, Attorney, Hodgenville.	
To fee in case Virginia Blanche Oldham, vs. Dr. Leigh Maupin.	
Nov. 30—Voucher Check No. 50	21.99
BUSH-KREBS CO., Louisville.	
To 6 cuts for Journal.	
Nov. 30—Voucher Check No. 51	50.00
CLARENCE NEIGHBORS, P. M., Bowling Green.	
To postage on Journal.	
Nov. 30—Voucher Check No. 52	657.21
TIMES-JOURNAL PUBLISHING COMPANY, Bowling Green.	
To 2350 December Issue, 104 Pages	661.71
Less Envelopes not ordered	15.00
Less by 36 errors @ 25c each	9.00
	24.00
	637.771
To 500 Letterheads and 500 Envelopes, President	6.50
To 500 Letterheads and 500 Envelopes, Chairman Council	6.50
To 500 Letterheads and 500 Envelopes, President-Elect	6.50
	19.50
	657.21
Dec. 22—Voucher Check No. 53	150.00
A. T. McCORMACK, M. D., Louisville.	
To December salary, Secretary.	
Dec. 22—Voucher Check No. 54	100.00
L. H. SOUTH, M. D., Louisville.	
To December salary, Business Manager.	
Dec. 22—Voucher Check No. 55	100.00
J. F. BLACKERBY, Louisville.	
To December salary, Rendered Committee on Public Policy.	
Dec. 22—Voucher Check No. 56	75.00
ELVA GRANT, Louisville.	
To December salary, Bookkeeper.	
Dec. 22—Voucher Check No. 57	200.00
FORESTER & SMITH, Attorneys, Harlan.	
To services rendered in case Moreland vs. Dr. E. W. Miracle.	
Dec. 22—Voucher Check No. 58	3.22
BUSH-KREBS CO., Louisville.	
To 1 Zinc Etching.	
Dec. 22—Voucher Check No. 59	25.00
LOUISVILLE POSTMASTER, Louisville.	
To postage for Journals.	
Dec. 22—Voucher Check No. 60	350.00
TIMES-JOURNAL PUBLISHING COMPANY, Bowling Green.	
To account of January Journal.	
1932	
Jan. 30—Voucher Check No. 61	150.00
A. T. McCORMACK, M. D., Louisville.	
To January salary, Secretary.	
Jan. 30—Voucher Check No. 62	100.00
L. H. SOUTH, M. D., Louisville.	
To January salary, Business Manager.	
Jan. 30—Voucher Check No. 63	100.00
J. F. BLACKERBY, Louisville.	
To January salary, Rendered Committee on Public Policy.	
Jan. 30—Voucher Check No. 64	75.00
ELVA GRANT, Louisville.	
To January salary, Bookkeeper.	
Jan. 30—Voucher Check No. 65	150.00
L. R. CURTIS, Attorney, Louisville.	
To services rendered to January 1, 1932.	
Jan. 30—Voucher Check No. 66	4.69
BUSH-KREBS CO., Louisville.	
To 1 cut.	
Jan. 30—Voucher Check No. 67	652.12
TIMES-JOURNAL PUBLISHING COMPANY, Bowling Green.	
To 2300 January Issue, 72 Pages	466.24
Less Credit by Check No. 60	350.00
	116.24
Telephone Call to Dr. Simpson	3.40
To 2350 February Issue, 84 Pages	652.12
	532.48
	652.12
Feb. 29—Voucher Check No. 68	150.00
A. T. McCORMACK, M. D., Louisville.	
To February salary, Secretary.	
Feb. 29—Voucher Check No. 69	100.00
L. H. SOUTH, M. D., Louisville.	
To February salary, Business Manager.	
Feb. 29—Voucher Check No. 70	100.00
J. F. BLACKERBY, Louisville.	
To February services rendered Committee on Public Policy.	
Feb. 29—Voucher Check No. 71	75.00
ELVA GRANT, Louisville.	
To February salary, Bookkeeper.	
Feb. 29—Voucher Check No. 72	5.80
W. M. HOWARD, C. C. Clerk, Harlan.	
To court costs in case Eliza Moreland vs. E. W. Miracle, M. D.	
Feb. 29—Voucher Check No. 73	50.00
CLARENCE NEIGHBORS, P. M., Bowling Green.	
To Postage on Journals.	

Feb. 29—Voucher Check No. 74	557.90
TIMES-JOURNAL PUBLISHING COMPANY, Bowling Green.	
To 2350 March Issues, 92 Pages	576.64
Less 5% Discount	28.74
	545.90
Less 40 Errors @ 25c each	10.00
	535.90
To 1000 Letterheads and 1000 Envelopes, Secretary Eye, Ear, Nose and Throat Section	9.00
To 500 Letterheads and 500 Envelopes, President, Eye, Ear, Nose and Throat Section	6.50
To 500 Letterheads and 500 Envelopes, Treasurer, Eye, Ear, Nose and Throat Section	6.50
	22.00
	557.90
Mar. 31—Voucher Check No. 75	300.00
A. T. McCORMACK, M. D., Louisville.	
To March salary, Secretary	150.00
To expense	150.00
	300.00
Mar. 31—Voucher Check No. 76	100.00
L. H. SOUTH, M. D., Louisville.	
To March salary, Business Manager.	
Mar. 31—Voucher Check No. 77	100.00
J. F. BLACKERBY, Louisville.	
To March services rendered Committee on Public Policy.	
Mar. 31—Voucher Check No. 78	75.00
ELVA GRANT, Louisville.	
To March salary, Bookkeeper.	
Mar. 31—Voucher Check No. 79	3.15
MEFFERT EQUIPMENT CO., Louisville.	
To 1-M 4x6 Plain Cards Punched.	
Mar. 31—Voucher Check No. 80	548.72
TIMES-JOURNAL PUBLISHING COMPANY, Bowling Green.	
To 2375 April Issues, 96 Pages	577.60
Less 5% Discount	28.88
	548.72
Apr. 30—Voucher Check No. 81	135.00
A. T. McCormack, M. D., Louisville.	
To April salary, Secretary, \$150.00, less 10% reduction.	
Apr. 30—Voucher Check No. 82	90.00
L. H. SOUTH, M. D., Louisville.	
To April salary, Business Manager, \$100, less 10% reduction.	
Apr. 30—Voucher Check No. 83	90.00
J. F. BLACKERBY, Louisville.	
To April services rendered Committee on Public Policy, \$100.00 less 10% reduction.	
Apr. 30—Voucher Check No. 84	75.00
ELVA GRANT, Louisville.	
To April salary, Bookkeeper.	
April 30—Voucher Check No. 85	3.09
W. E. GARDNER, M. D., Louisville.	
To expense as Councilor, 5th District.	
Apr. 30—Voucher Check No. 86	75.32
P. F. BAKER, M. D., Louisville.	
To expense to Washington in interest of Maternal and Child Health Work.	
Apr. 30—Voucher Check No. 87	150.00
WOODWARD, HAMILTON & HOBSON, Attorneys, Louisville.	
To fee for services rendered in re: Funeral Directors of Fall Cities, et al. v. J. F. Blackerby, et al.	
Apr. 30—Voucher Check No. 88	100.00
FORCHT & CURTIS, Attorneys, Louisville.	
To services in re: Wm. Rosenfield, Admr., etc., vs. Frank T. Fort, M. D., et al.	
Apr. 30—Voucher Check No. 89	4.28
BUSH-KREBS Co., Louisville.	
To 1 cut.	
Apr. 30—Voucher Check No. 90	1.50
KENTUCKY BOOK MFG. Co., Louisville.	
To binding 1 book.	
Apr. 30—Voucher Check No. 91	85.23
NEW CAPITAL HOTEL, Frankfort.	
To expense of A. T. McCormack, M. D.	
Apr. 30—Voucher Check No. 92	544.01
TIMES-JOURNAL PUBLISHING COMPANY, Bowling Green	
To 2300 May Issue, 92 Pages	572.64
Less 5% Discount	28.63
	544.01
May 31—Voucher Check No. 93	135.00
A. T. McCORMACK, M. D., Louisville.	
To May salary, Secretary, \$150.00, less 10% reduction.	
May 31—Voucher Check No. 94	90.00
L. H. SOUTH, M. D., Louisville.	
To May salary, Business Manager, \$100.00, less 10% reduction.	
May 31—Voucher Check No. 95	90.00
J. F. BLACKERBY, Louisville.	
To May services rendered Committee on Public Policy, \$100.00, less 10% reduction.	
May 31—Voucher Check No. 96	75.00
ELVA GRANT, Louisville.	
To May salary, Bookkeeper.	
May 31—Voucher Check No. 97	150.00
RAY C. LEWIS, Attorney, London.	
To attorney fee in case: Sparks vs. J. D. Miller, M. D.	
May 31—Voucher Check No. 98	15.00
J. B. LUKINS, M. D., Louisville.	
To stationery, stamps and supplies used in Medico Legal Division for 2 years	



May 31—Voucher Check No. 99 .....	7.23
BUSH-KREBS COMPANY, Louisville. To 2 cuts.	
May 31—Voucher Check No. 100 .....	50.00
CLARENCE NEIGHBORS, P. M., Bowling Green. To postage for Journal.	
May 31—Voucher Check No. 101 .....	519.67
TIMES-JOURNAL PUBLISHING COMPANY, Bowling Green. To 2250 June Issue, 84 Pages.....	508.60
Less 5% discount .....	25.43
	<hr/> 483.17
To 2000 Post Graduate Course programs ..	30.00
To 500 Letterheads and 500 Envelopes, Secre- tary Third District Medical Society.....	6.50
	<hr/> 36.50
	<hr/> 519.67
June 30—Voucher Check No. 102.....	135.00
A. T. McCORMACK, M. D., Louisville. To June salary, Secretary, \$150.00, less 10% reduction.	
June 30—Voucher Check No. 103 .....	90.00
L. H. SOUTH, M. D., Louisville. To June salary, Business Manager, \$100.00 less 10% reduction.	
June 30—Voucher Check No. 104 .....	90.00
J. F. BLACKERBY, Louisville. To June services rendered Committee on Public Policy, \$100.00, less 10% reduction.	
June 30—Voucher Check No. 105 .....	75.00
ELVA GRANT, Louisville. To June salary, Bookkeeper.	
June 30—Voucher Check No. 106 .....	28.75
P. F. Barbour, M. D., Louisville. To expenses as President-Elect.	
June 30—Voucher Check No. 107 .....	12.00
ELECTRIC BLUE PRINT & SUPPLY, CO., Louisville. To 300 blue prints for Louisville meeting.	
June 30—Voucher Check No. 108 .....	3.79
BUSH-KREBS CO., Louisville. To 1 cut.	
June 30—Voucher Check No. 109 .....	100.00
N. R. PATTERSON, Attorney, Pineville. To services in the United States District Court for the Eastern Ken- tucky District in suit of Dewey Davidson vs. The Middlesboro Hospital et al.	
June 30—Voucher Check No. 110 .....	45.00
HARRY S. SMITH, Louisville. To reporting annual meeting of the Eye, Ear, Nose and Throat Section at the Kentucky Hotel, Louisville, May 16, 17, 1932.	
June 30—Voucher Check No. 111 .....	445.74
TIMES-JOURNAL PUBLISHING COMPANY, Bowling Green. To 2200 July Issue, 76 Pages .....	469.20
Less 5% Discount .....	23.46
	<hr/> 445.74
July 30—Voucher Check No. 112 .....	135.00
A. T. McCORMACK, M. D., Louisville. To July salary, Secretary, \$150.00, less 10% reduction	
July 30—Voucher Check No. 113 .....	108.33
L. H. SOUTH, M. D., Louisville. To July salary, Business Manager, \$100.00 less 10% reduction ..	90.00
To expense to Pineville, May 16 and 17.....	18.33
	<hr/> 108.33
July 30—Voucher Check No. 114 .....	90.00
J. F. BLACKERBY, Louisville. To July services rendered Committee on Public Policy, \$100.00, less 10% reduction.	
July 30—Voucher Check No. 115 .....	75.00
ELVA GRANT, Louisville. To July salary, Bookkeeper.	
July 30—Voucher Check No. 116 .....	254.48
L. R. CURTIS, Attorney, Louisville. To legal services in case Rose vs. Dr. Moren, et al.....	104.48
To legal services January 1, to July 1, 1932.....	150.00
	<hr/> 254.48
July 30—Voucher Check No. 116-A .....	75.00
CRAFT & STANFILL, Attorneys, Hazard. To services rendered in case, Sam Combs vs. Drs. Hurst & Snyder.	

July 30—Voucher Check No. 117	1.94
RUTH FLAGG, Louisville.	
To expense incurred during Post Graduate Course, 6:6-10,32.	
July 30—Voucher Check No. 118	7.56
REBECCA R. CASSELL, Louisville.	
To expense incurred during Post Graduate Course, 6:6-18,32.	
July 30—Voucher Check No. 118-A	3.92
MAYME SULLIVAN, Louisville.	
To reimbursement for express charges on Journal material.	
July 30—Voucher Check No. 119	3.96
BUSH-KREBS CO., Louisville.	
To 1 cut.	
July 30—Voucher Check No. 120	10.00
KENTUCKY BOOK MFG. CO., Louisville.	
To sewing and binding 10 copies of Medical Pioneers of Kentucky.	
July 30—Voucher Check No. 121	19.91
Woman's Auxiliary, Kentucky State Medical Association, Louisville,	
to 25% Commission on Advertisements amounting to \$79.64.	
July 30—Voucher Check No. 122	493.26
TIMES JOURNAL PUBLISHING COMPANY, Bowling Green.	
To 500 Letterheads, Chairman Medico-Legal Division	4.00
To 300 Applications for Space	7.50
To 300 Commercial Exhibits	6.50
Postage	.26
	18.26
To 2250 August Issue, 80 Pages	481.80
Less 5% Discount	24.10
	457.70
To Envelopes	15.00
To Printing Envelopes	2.30
	475.00
	493.26
Aug. 1—Voucher Check No. 123	135.00
A. T. McCORMACK, M. D., Louisville.	
To August salary, Secretary, \$150.00, less 10% reduction.	
Aug. 31—Voucher Check No. 124	90.00
L. H. SOUTH, M. D., Louisville.	
To August salary, Business Manager, \$1-00.00, less 10% reduction.	
Aug. 31—Voucher Check No. 125	90.00
J. F. BLACKERBY, Louisville.	
To August services rendered Committee on Public Policy,	
\$100.00, less 10% reduction.	
Aug. 31—Voucher Check No. 126	75.00
ELVA GRANT, Louisville.	
To August salary, Bookkeeper.	
Aug. 31—Voucher Check No. 127	400.00
TIMES-JOURNAL PUBLISHING COMPANY, Bowling Green.	
To account of September Journal.	
Total	\$16,652.57
Government Tax on Checks	.20
Grand Total	\$16,652.77



## ORIGINAL ARTICLES

PREMATURE  
AND IMMATURE INFANTS.VITALITY STATISTICS OF 538 PATIENTS WEIGH-  
ING BETWEEN 1000 AND 2500 GRAMS WITH  
A DISCUSSION OF THEIR CARE AND  
TREATMENTT. COOK SMITH, M. D., H. S. ANDREWS, M. D.,  
AND MARGARET LIMPER, M. D.

Louisville.

## Introduction.

In Louisville, there are born alive each year between five and six thousand infants. Five thousand four hundred and nine were reported in 1931. In that year, 423 infants died, and twenty-five percent of these deaths were ascribed to prematurity by the physicians signing the death certificates. Premature birth represents about 7 percent of all births. Martin of Eberfeld (1) in a total of 16,000 deliveries found 7 percent premature, and of these, 83 percent were live births and 17 percent still-born.

The United States birth rate has been falling steadily since colonial times (2). In this city, the colored birth rate has fallen more rapidly than the white; both are less than half their former rates. Birth control activities may be partly responsible, but many other factors seem to be at work at the same time. It would seem highly necessary that we conserve living births to the best of our abilities, and the premature infant should be conserved as conscientiously as may seem proper in the treatment of any other patient. They are so often the most wanted and cherished infants that are born and come frequently to an otherwise childless marriage.

Table 1 shows the death rate of living new-born infants as determined in a private hospital of this city. In a six year period, there were 2,137 living births with a mortality rate of 2.8 per cent. In Table II are the results obtained in 6,526 living deliveries at the Louisville City Hospital on both the outside and inside services. This group had a mortality rate of 4.9 percent. The colored rate was 4.7 per cent, and the white rate was 5.0 percent. These figures are shown in order that we may contrast them with the statis-

tics, which will be given for the group included in this study.

Table III records 538 infants within a weight group from 1,000 to 2,500 grams. The first group, those weighing between 1,000 and 1,500 grams, had a vitality of 18 percent. In the next group of 1,500 to 2,000 grams, there were 147 with a vitality rate of 55 percent. In the larger group, some of whom were not premature, but all weighing less than five and a half pounds, there were 328, with a vitality rate of 85 percent.

Contrasting these figures in a different way they are divided into those infants weighing from 1,000 to 2,000 grams (2 4-16 to 4 8-16) all of whom were premature, having a vitality rate of 46 percent, and the larger group from 2,000 to 2,500 grams for which the vitality rate was 85 percent. This demonstrates the increasing margin for safety as the infant approaches full term.

TABLE I.

New-Born Mortality in a Private Hospital for a  
Six Year Period. (Still-Births are  
not included).

Year	No. Births	No. New-born Deaths
1925	296	9
1926	281	7
1927	263	10
1928	313	13
1929	370	5
1930	319	7
1931	295	9
Total	2137	60

Mortality 2.8 percent.

TABLE II

Mortality Record New-Born Infants in a Public  
Hospital Service for a Six Year Period.

Year	Total Deliveries	Total Died	Total Died
1926	728	42	5.7
1927	938	38	4.0
1928	988	59	5.9
1929	1132	50	4.4
1930	1305	47	3.6
1931	1435	87	6.0
1926-1931	6526	323	4.9

\*From the Pediatric Department of the University of Louisville. Read before the Jefferson County Medical Society.

TABLE III

Six Year Summary of Infants of Weights 1000 to 2500 Grams (2-4 to 5-8 Pounds)

Weight in grams Total (pounds)		Lived	Died	Lived	Died
1000-1500 (2 4-16 to 3 5-16)	63	11	52	18%	82%
1500 - 2000 (3 6-16 to 4 8-16)	147	80	67	55%	15%
2000 - 2500 (4 8-16 to 5 8-16)	328	276	52	85%	15%
Totals	538	367	171	69%	31%
Colored	318	228	90	72%	28%
White	220	139	81	63%	37%
1000 - 2000 (2 4-16 to 4 8-16)	210	91	119	46%	54%
2000 - 2500 (4 8-16 to 5 8-16)	328	276	52	85%	15%
Luetic (born alive)	85	50	35	59%	41%
Mothers with positive Wass. treated once or more prenatally	26	16	10	62%	38%
Untreated	59	34	25	58%	42%

This table also demonstrates our experience with both colored and white infants of this class. The colored, comprising 318, had a vitality rate of 72 percent, whereas the white group of 220 showed a vitality rate of 63 per cent. This is a marked contrast with the greater vitality of the white infant throughout the first year.

Luetic infants, of whom there were 85, had a vitality rate of 59 percent. We find that infants born of mothers with positive Wassermann tests, who were treated once or more prenatally, had a vitality rate of 62 per cent, while the vitality rate of those whose

luetie mothers were untreated was 53 percent.

We have not given separate vitality rates for infants who lived beyond the first day of life. Every infant who was considered alive at birth is included. Also, among the mortalities are some infants who lived in the hospital as long as three months, but who died before discharge. There are included also a few infants who were discharged from the hospital against advice, but who had been treated for several weeks. This report does not include a history of these infants after discharge.

In Table IV are figures recently published by Hess (3). They are not directly comparable to ours, inasmuch as our patients were born within our own service and did not require transportation. His patients came largely from outside of the premature station. This works to both favorable and unfavorable ends, inasmuch as those infants who died very quickly in the first few hours of life would not have been admitted to his mortality figures, while many infants who were poorly treated on the outside were admitted to his hospital and entered into his death statistics.

Hess' figures for 761 infants show a general vitality rate of 62 percent. In our group the rate was 69 percent. Grouping his patients, we find that those between 1,000 and 1,500 grams showed a survival rate of 35 percent. Infants of the same weight groups with us showed only 18 percent. His groups from 1,500 to 2,000 grams survived at the rate of 68 percent and ours at the rate of 55 percent.

In our study, the death rate for infants weighing less than 2,000 grams (4 1-2 pounds) is almost four times as great as that for infants weighing from 2000 to 2500 grams (4 1-2 pounds to 5 1-2 pounds). The

TABLE IV \*  
DATA OF VITALITY

Birth weight in grams	Total Admissions	Surviving first 24 hours	Surviving first 96 hours	Graduated		Graduated infants surviving first day
				Number	Percent	
Less than 1000.....	42	18	14	4	9.5	22.2%
From 1000 to 1500...	148	92	91	52	35.1	56.5%
From 1500 to 2000 ..	280	242	239	193	68.9	79.7%
From 2000 to 2500 ..	197	183	181	157	79.7	85.7%
From 2500 to 3000 ..	42	39	39	38	90.5	97.4%
Over 3000 .....	4	4	4	2	50	50%
Unknown .....	48	46	40	29	60	63%
Totals.....	761	626	594	475	62.4	75.88%

\*Hess—Premature Infants., Penn. Med. Jour., April, 1930.



group of more premature infants weighing less than 2000 grams with a mortality rate of 54 percent emphasizes the fact that they should be handled carefully and understandingly.

#### THE CARE AND TREATMENT OF THE PREMATURE INFANT

Points of emphasis may be outlined as follows:

1. Maintenance of normal temperature in a heat labile organism without restriction of exercise.
2. Food: beginning with small amounts and given in the best way for each child.
3. Precaution against infections.
4. Special precautions for the prevention of vitamin deficiency.

We are forced daily to the opinion that the premature baby is very greatly neglected in most instances. There is a peculiar attitude toward very small infants. This brings about a state of affairs in which the premature infant is born and must be cared for by some one other than the physician. It is necessary that the physician turn his attention to this child as a problem both for diagnosis and treatment. It seems very strange that a group of patients with a higher mortality rate than almost any condition which we care for in our medical experience should be left in the hands of nurses without a definite outline of treatment.

#### HEAT REGULATION

The first attention of the physician in care of the premature or immature child should be the control of body temperature. This may be done by the use of many contrivances now available. Most of the patients mentioned in this paper have been treated by the use of wooden boxes measuring 18x12x12 inches. These boxes have no bottoms and are placed over the babies as they lie in ordinary infant beds. The box has a hinged top, a sliding glass window in the top, and sliding glass windows in the sides. A thermometer is inside and can be seen through the window. These "brooders" are not expensive, costing less than ten dollars each. They are heated by an electric light which may be of 40 watts in most cases, but can be used in both larger and smaller sizes. These boxes are in a room which is kept at a temperature of 80 degrees Fahrenheit. The baby's chart records the temperature of the room and also of the box. We have made no attempt as a rule to control humidity accurately. The comparative temperatures of the baby's box and room are watched very carefully until it is found how much ventilation is necessary for the child in question. It is considered better to have the infant's temperature as high as 101 degrees rather than

to have it remaining very long as low as 97 degrees. Infants who have been at a low temperature for any considerable period of time react poorly to treatment. Very high temperatures above 104 and 105 degrees are dangerous, producing cyanosis and other difficulties. An understanding nurse will be able to keep the baby's temperature within safe limits in a contrivance such as this. The infants are entirely unclothed and are kept clean by means of oil. They have great freedom of motion, and we have been quite surprised after the first few days to find them moving about as much as they do. We believe that there is some value in the provision for this exercise on the part of the premature child.

#### Food

A second point of importance is the choice of food. We use boiled breast milk entirely and feel that nothing should be substituted for it if it is available. We bend every effort to secure it, and consequently, feed all of our patients, at least through the early stages of our care, on this food. It is important to know how much to feed, when to begin feeding, and in what manner to administer food. For a period of 6 to 12 hours after birth, we offer no food whatsoever. If the baby seems to react well after 6 hours, we give by medicine dropper 5 c.c. of sterile water. If this is well taken and swallowed efficiently, water is given every 2 hours. If water is well taken during the first 12 hours, the first feeding of breast milk may be offered. This is 5 c.c. in quantity, and it, too, is given by a medicine dropper if the baby swallows well. Water is given half way between most of the feedings. It is found very frequently that the medicine dropper or nipple method of giving water and food causes too much fatigue, and consequent cyanosis. Therefore, many infants do best if fed entirely by gavage for the first few days of life. An aseptic syringe, one-half ounce in capacity, with a pointed tip which will fit into a No. 10 catheter, is satisfactory for this purpose. The catheter should be passed, according to the method described by Hess, through the mouth for a distance equal to the measurement from the bridge of the infant's nose to the xyphoid process. The 5 c.c. amount of food is increased on the following day, if all is well, to 10 c.c. at each feeding. We cannot emphasize too much the necessity for judging carefully when to increase or decrease food. If there is any regurgitation, distention, or production of cyanosis go very gingerly about the increments. Increase the food under judgment slowly until the infant is getting sufficient calories to gain in weight. In Table V the patient gained nicely when the calories reached 60 per pound.

TABLE V	
Names: Infant	Birthdate <u>June 8, 1930</u>
Mother	Weight at Birth <u>&lt;3 lbs</u>
Address	Sex <u>FEMALE</u>
Diagnosis <u>Premature Birth</u>	Doctor

DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
TEMPERATURE														
WEIGHT AND FLUID RECORD														
STOOLS	4	3	3	4	3	7	7	7	6	6	7	7	6	6
VOMITING	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CALORIES	0	28	28	56	84	168	168	196	196	196	224	224	224	224
BREAST MILK, AMOUNT EACH FEEDING														
FORMULA, REMARKS, OR, SPECIAL TREATMENT.														

There is no rule in this matter, but many do well and will gain when receiving 50 calories per pound. Most prematures handle small amounts of food at a time, and, therefore, many will need regular feedings throughout the night.

#### INFECTION

Too much cannot be said about the necessity for having these infants out of contact with people. The premature infant is a cynosure and often fatally so. Friends leaning over to see the curiosity and talking all the



while seem to be a great source of spray infection. Handling should be by nurses who care for no other patients. They should never be housed in association with the children's ward, nor should nurses from the children's ward relieve the nurses in charge of them. We have seen premature infants introduced into the children's ward, gain nicely for a week, and then suddenly show a sharp fall in weight with metabolic disturbances accompanied by pharyngitis and otitis media. When diarrhoea occurs in the premature, infection should be thought of.

#### VITAMIN DEFICIENCY.

More thoughtful attention must be given to vitamin necessities at this time of life than at any other. Special precautions to guard against rickets must be taken by the use of cod liver oil with additional Vitamin D. A satisfactory routine may be established by using cod liver oil and viosterol combined. This may be done by giving 2 c.c. of cod liver oil and 20 drops of viosterol daily for the first three months. It is a great mistake to put oils in the infant's milk as much of it is found sticking to the inside of the bottle. Orange juice must be begun early, usually after the first 2 weeks, and may be given to the larger prematures as one teaspoonful of orange juice in one-half ounce of water. In the smaller ones, we sometimes begin by adding 5 to 10 drops of orange juice to the daily breast milk feedings. In transferring the infant from breast milk feedings to formula feedings, it is well to use gradual substitutions. The formulas which we use for the full-term new-born infant seem applicable to the premature infant after he is one or two months old. We use cooked formulas entirely, and have noted very little difference in the various types, but they must be adapted to the child's caloric needs and must be concentrated.

#### ANEMIA

This must be thought of early in the premature child, and the prevention of rickets probably plays some part in its prophylaxis. We have the impression that some premature infants, in spite of all methods of feeding with which we are familiar, will develop an anemia toward the end of the first year. Some of these respond quickly to iron and ammonium citrate and some to egg feeding. Some have developed anemia in the presence of adequate amounts of iron, egg, vegetable puree, liver and other meat feedings. It may be possible to prevent some of these anemias by the use of that form of liver extract which is devised for secondary anemia.

#### THE TREATMENT OF UNTOWARD SYMPTOMS CYANOSIS

It is well to emphasize the fact that cyanosis is caused more commonly in the prema-

ture or full-term infant by conditions other than congenital heart disease. It might seem unnecessary to mention this, but we find congenital heart disease so commonly on death certificates of the new-born that we feel an expression of opinion may be of some benefit. In the presence of cyanosis, we must think of several causes. Among them are intracranial damage, atelectasis with or without intracranial damage, abdominal distention, gastric distention, overheating, refrigeration, respiratory infection, and obstruction to breathing caused by mucus in the nasopharynx. Rhinitis alone in infants who do not breathe through their mouths reflexly will cause grave cyanosis. Careful examination and analysis must be done in each case before treatment is instituted. In distention, the passing of a catheter very gently into the stomach will often give great relief as will the passing of a rectal catheter at times; reduction of the child's temperature to a more normal level if here is overheating, and removal of mucus from the pharynx in some cases. For atelectasis, inhalation of carbon dioxide 5 percent and oxygen 95 percent will often restore a better color. Some infants are benefited by the inhalation of carbon dioxide and oxygen mixtures after feedings which have produced fatigue and consequent cyanosis. When cyanosis is caused by intracranial pressure, the treatment resolves itself into the use of several measures. Such patients should be thought of as in a similar condition to older patients with head injuries. Changing the child's position from prone to 45 degrees while lying in bed will help some. Lumbar puncture is occasionally helpful. Some patients seem benefited by hypodermic injections of 2 grains of caffeine sodium benzoate every 6 hours. This has been shown by Denker (4) to reduce spinal fluid pressure definitely over considerable periods of time in older patients. When convulsions accompany birth injury, there is some value in the use of sedatives, such as luminal in large doses (grs. ss) and at times by the administration of olive oil one-half ounce and ether one-half dram by rectum. The control of twitching and light convulsions will often restore more normal respiratory rhythm. Fluids should not be entirely restricted in birth injury, but there is some value in moderately restricted amounts.

#### DIARRHOEA

Diarrhoea must be carefully judged. Frequency of stools may be seen in Table V, where there were seven or eight movements a day. This may be normal in some babies who are gaining and doing well. In a true diarrhoea with excoriation of the skin, apparent illness in the child, loss of weight, and regurgitation of food, it is well to give

nothing but sterile water, sterile normal saline, or weak tea solutions. When food has been restricted for 12 hours, begin again using small amounts as advocated in the plan suggested for the feeding of the first two days of life in the premature child. A blood transfusion seems to give benefit to some of these children in the early stages of their treatment. Intraperitoneal saline may be used if necessary, but never in the presence of distention. It sometimes causes shock and difficult breathing in the small infant. Boiled breast milk seems to us the best type of food for the premature infant with diarrhoea.

#### NURSING

In caring for all these difficult situations, the greatest success will be obtained by having a nurse constantly in attendance who has had wide experience in the care of premature infants. She should confer with the doctor in charge daily. There are many critical moments when the difference between failure and success in the care of the premature baby may depend upon doing the correct, even though trivial thing, at the right time.

#### CONGENITAL SYPHILIS

This is a very large subject and will only be touched upon lightly at this point. We suggest that the infant born of a syphilitic mother be established as well as possible in his regular premature routine before beginning anti-syphilitic therapy, unless there are frank symptoms and signs of syphilis when first seen.

#### CARE OF THE SKIN.

It is our opinion that these infants have a more normal skin when placed undressed in the electrically lighted box. They are cleaned with oil at birth and are kept clean with oil in most cases for the first two or three weeks of life. It is possible to bathe them carefully in a warm place with or without oil, but in this group most of them have been oiled throughout the first half of their stay in the hospital.

#### SUMMARY

1. Neonatal mortality in a public hospital for a period of six years has been shown.
2. The colored infant showed a lower mortality rate for the new-born period than did the white infant.
3. Mortality rates are given for 538 premature and immature infants weighing between 1,000 and 2,500 grams. The rates are given for the group as a whole and also in three divisions according to weight.
4. The mortality rate for infants whose weights are less than 2,500 grams was seven

times that of the general neonatal mortality rate for this hospital. Infants weighing between 1,000 and 1,500 grams had a mortality rate three times as high as those weighing between 1,500 and 2,500 grams.

5. The colored premature infant had greater vitality under the same conditions than did the white premature infant.

6. Recommendations for routine premature care are given.

7. Treatment in complications commonly arising in premature care is discussed.

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#### DISCUSSION

**J. H. Pritchett.** I wish that every member of the Jefferson County Medical Society could have heard this paper. I consider it one of the most important and instructive we have ever heard. This paper represents a great amount of work, personal thought, research and study.

For sake of discussion, we may say that prematurity is of two types: First, the normal premature, that is, the infant who presents no evidence of injury or disease. Second, the pathological premature in which not only is there prematurity but also evidence of some pathology as intra-cranial hemorrhage, atelectasis, syphilis or some such disorder. In the latter type the mortality, as would be expected, is extremely high. Fortunately prematurity is the exception, therefore, no hard or fast rules can be laid down. Age and weight alone will not determine the requirements and tolerance in the premature. Stage of development is a more important factor in establishing the functional capacity of the gastro-intestinal system. In other words, each premature is a law unto itself. However, certain cardinal principles are most essential, such as, first, maintenance of body heat, second, to produce a suitable and sufficient food. Breast milk is the *Sine Qua Non* and can in the majority of cases be procured. We should obtain it from whatever source possible, and if in doubt as to its purity, boil it. Lactic acid milk can be used since it affords a food rather high in caloric value to a small amount of fluid intake. By that, I mean we can give a much stronger formula as regards the food and protein ratio, thus assuring more calories to the ounce than would be otherwise possible. The feeding interval calls for some consideration. Provided the infant can take either by bottle, feeder, or tube (and many must thus be fed) a sufficient amount and re-



tain it, the four hour interval is the best, as it allows complete stomach emptying and disturbs the infant the least and gives more rest. If the infant is unable to take or retain such amounts of food as needed on the four hour schedule then the two or three hour interval must be tried. The important question is that they must have a definite amount of food in twenty-four hours.

A third cardinal principle is the prevention of infection. This can best be done by having some intelligent, responsible person to have entire charge of the infant. A nurse trained in the care of prematures will be of immense value along this line. If possible, such cases should be cared for in hospitals where special apparatus, as Dr. Smith has shown us, can be used.

Such symptoms as cyanosis, vomiting and diarrhoea are bad signs and certainly increase the worry of all concerned. It is well to remove the infant from the incubator as soon as compatible with the progress made. Bearing in mind the fact that these infants have a very low calcium and phosphorus content, the factor of rickets and anemia becomes an important one. The early use of vicsterol and cod liver oil, and even at times blood transfusions, are important. The inference from Dr. Smith is that the incidence of prematurity is on the increase. Regardless of the usual etiological factors, the fact remains that the stress and strain and mental worry produced by the prolonged economic situation will further increase the problem of those of us who care or attend such infants.

**S. H. Starr:** The treatment of the premature baby immediately after the delivery deserves special emphasis. This treatment consists principally in maintenance of temperature; immediately after birth cover the baby with a towel, clamp and cut the cord and place the infant in a warm bed with the least possible delay.

The prevention or prophylactic treatment is an extremely important matter. Syphilis and toxemias are the most frequent known causes of prematurity. By instituting intensive antileptic treatment the premature incidence approaches that of non-luetic. Of course the proper management of toxemia reduces those cases to a minimum of prematurity. It may be well to mention however, that approximately half of the prematures at the City Hospital have undetermined causes.

Generally speaking, the prognosis of premature babies due to morbid conditions in the mother, such as ante-partum hemorrhage, toxemias, and syphilis is much worse than in those children whose mothers are apparently healthy.

**James W. Bruce:** This certainly has been a most interesting paper of Dr. Smith's and rep-

resents a tremendous amount of work on his part.

I would like to mention one more cause of prematurity; that is, "shot-gun marriages."

Regarding the matter of the type of food for the premature baby: Breast milk is an essential food. Every premature infant should positively receive breast milk; one should go to any amount of trouble to obtain breast milk. In some cities there are Breast Milk Dispensaries. It is a rather pathetic sight to see the father of a premature infant going around from one hospital to another begging breast milk for his baby. I had a case recently where the parents made arrangements with some people in Cincinnati to send a pint of breast milk to them every day over the B. & O.

Now, as to the manner in which a premature baby should be fed. Of course, they should be fed from a bottle if they will take their milk that way: but usually the premature infant is so weak that he uses too much energy and vitality to swallow his food. The premature should not be fed longer than 10 minutes at a time. The use of a medicine dropper often chokes a baby and one is liable to get food into the larynx, so this can be a dangerous thing. I believe the method of feeding the premature baby by gavage is the preferable way. This takes a minimal amount of time and energy. It is the better way to feed a premature, especially during the first few days of life. Give 5 c.c. of milk every three or four hours, increasing 5 c.c. every day until you get up to the caloric requirement.

Carbon dioxide and oxygen mixtures are helpful in getting the respirations of premature babies under way. Use 90 to 95 percent oxygen and 5 to 10 percent carbon dioxide. Carbon dioxide stimulates respirations and makes them deeper and fuller, expands the lungs more completely and prevents atelectasis. You will notice from Dr. Hess' statistics that atelectasis is the chief cause of death in prematurity. Atelectasis may cause death by itself or may become infected and give rise to bronchopneumonia. You will see that bronchopneumonia ranks high as cause of death in prematurity. I believe the routine use, every three or four hours for 5 or 10 minutes at a time, of carbon dioxide and oxygen mixtures is a good thing in premature babies.

Premature babies are very susceptible to rickets and should be given antirachitic treatment as early as possible. Cod liver oil does not stay on the stomach very well and ultra violet lamps are impractical for most prematures. This is a splendid field for viosterol. It should be given in large doses, about 20 drops a day. I have never seen it do any harm and have been able to prevent rickets in several very small prematures.

Why does the premature baby require so

much food? We ordinarily say that food energy is used in four ways:

1. Basal metabolism.
2. Activity.
3. Excretion.
4. Growth.

Now we know that basal metabolism is low in prematurity. We also know what activity is practically nothing. Excretion can be estimated at 10 percent the same as with older children. Therefore, we are forced to the conclusion that rapid growth is the way this food energy is largely used. The rapid rate of growth of the premature bears this out. Where the full term baby doubles its weight in five months and triples it in a year, the premature may double its weight in three months and increase four or five times its birth weight in a year.

The question always arises, is the ooby worth saving. Statistics vary on the outlook for premature babies. Some figures show that prematures do as well as full term babies. Others show that the incidence of subnormal mentality, paralysis and defects of various kinds is higher in prematures than in full-term babies. However, as Doctors, it is up to us to do the best we can.

**Alfred N. Pickett:** In this hospital the babies are put under the care of the pediatric department as soon as they leave the delivery room. The obstetricians, however, have the opportunity of watching the treatment of all babies and of course we have been especially interested in the prematures. In spite of thirteen years of such opportunities, I do not yet feel capable of taking care of premature babies. More and more I come to realize that each premature baby is a law unto itself requiring the most meticulous care of an experienced pediatrician.

For several years now I have been following a plan which I can heartily recommend to every general practitioner and obstetrician present here this evening. Whenever one of my patients goes into premature labor I ask a pediatrician to be present in the delivery room at the time of the delivery. The baby is turned over to him as soon as the cord is cut and the full responsibility for the neonatal care is laid upon him. It is not fair to the baby or to the pediatrician to call in the consultant after the care given by the obstetrician has proven a failure and valuable time has been lost. Nor is it fair and honest to turn over the care of the baby to the nurses who must "bootleg" experienced advice from the pediatrician who may be visiting patients in the nursery. I feel that the premature baby is safer in the hands of the pediatrician than he is in mine. He certainly deserves all the help that the medical profession can give him. You have been listening to the distressing mortality rates prevalent among premature babies. Surely none of us could be criticized for asking for help when we are caring for a condition which results in

a mortality rate of 40, 50 or 60 percent.

**W. T. McConnell:** I think Dr. Smith has convinced us of the fact that much depends upon the prenatal care of the mother. If the mother who is not well gives birth to a premature baby because of her devitalized condition, the infant is in grave danger. A premature of 7½ months born of a healthy mother has a better chance than a 8½ months' child born of a diseased mother. Especially is this true when the mother has a disease such as syphilis or toxemia. If we are going to do our part as obstetricians, we have to see to it that our mothers are kept in the very best condition. If she does get this care, even though the baby is premature, it has a much better chance. We have to look out for early signs of toxemia in our patients. If we can do this, we can contribute our part as obstetricians.

Dr. Smith gave us a very valuable paper and brought to my mind the thought that if we do the best for the premature, we must see that the mother is taken good care of before the birth of infant, then when the baby arrives secure a good pediatrician and a good nurse to see that baby is well taken care of.

**J. J. Glaboff:** Quoting the statistics of Dr. Crawford, published in 1931, concerning the number of births at the Philadelphia Lying In Hospital, I wish to state that out of 4,495 deliveries there were 231 prematures, or a percentage of 5.2. In 91 cases the causes for prematurity were as follows: 31 due to syphilis; 26 to twins; 12 to toxemia; other causes accounted for the remainder. Of these 231 prematures, 82 died, or a mortality rate of 35%. This was accounted for as follows: Prematurity, 50%; lues 23.2%; intracranial injury, pulmonary atelectasis and pneumonia each 5%. The average age of the mother in this series was 21 years. She had had 2-mos. prenatal care and 91.8% were in perfect health. The average weight of these prematures was 4-lbs. There was a 7-oz. loss during the first five days. Birth weight regained on the 11th day and weight on the 21st day was 4-lbs. and 14-oz.

Gertrude Griess at the Cologne Children's Clinic, stated that out of 383 prematures born within the past ten years, 55% died. Pneumonia was one of the largest causes of this.

I also want to mention that in Von Russ' statistics taken from a period of 4½-yrs., as reported in 1930, that none of the prematures under 1500-grams survived.

Infants under 28-weeks have a bad prognosis and over 32-weeks the prognosis as to life is better.

I wish to thank Dr. Smith for his wonderful presentation of this subject.

**Max L. Garon:** In Dr. Hess' Vitality tables there is a group of prematures weighing 6-6½-lbs. Dr. Smith very aptly brought out the fact that many full term children are born weighing, 10, 11 and even 12-lbs. and that it would



be logical to expect these mothers, should they be forced to premature labor, to deliver a fetus of 6-lbs. at 7 or 7½-mos. In a case of this sort, I would like to know what criteria are employed in determining the prematurity?

**Leon L. Solomon:** I arise to pay public tribute to the fine paper presented this evening by Dr. Smith. I am impressed by the enormity of statistics referred to by the essayist, which includes more than 7,000 cases of premature infants recorded in this hospital, and some 15,000 recorded elsewhere, also reviewed by the essayist.

Medicine has, indeed, become daily more accurate. I recall that there were only four premature births in the City Hospital during the year in which I served, ending March, 1894. Two of these cases were seen in my service—one was a spontaneous delivery, in which the infant was expelled into the toilet. The young mother seized with severe cramps, which she interpreted as being in the bowels, left her bed before she had been taken to the delivery room. The baby, a six months' fetus, was placed in just such a constructed box as the one shown by Dr. Smith tonight. This home-made incubator was the property of Dr. R. B. Gilbert, Professor of Pediatrics in the University of Louisville. It was heated by a coal oil lamp.

The mortality among premature babies was, in those days, exceedingly high. As a matter of fact, the baby under seven months was considered as hardly worth an effort to save.

Though medicine is not a mathematical science notwithstanding the many strides recently made, and other refinements and advances which will come with time, and though it may never achieve mathematical precision, slowly, but certainly, we march ahead, there being in no department more worthwhile to advance than that which has been recorded in the lowering of mortality rate during infancy and early childhood. I congratulate the society on having been permitted to hear Dr. Smith's paper.

**Dr. T. Cook Smith** (in closing): I wish to thank you gentlemen and Dr. Pickett for your kind discussions.

I am unable to date the antiquity of such contrivances as this premature box. Dr. Rotch had a box which was a good deal like the one which I have shown this evening. I believe also that it was arranged so that the baby could be weighed without taking him from the box. It was heated by a metal flue passing through the box and leading to a little burner. The questions as to the criteria for determination of prematurity are many. If course, weight is not the only consideration. The condition of the skin is especially important. In the premature, it is red, wrinkled, lacking in subcutaneous fat, and covered with fine lanugo hair; lack of growth of the nails; the type of reaction to various stimuli; the failure to maintain a normal temperature; all of these are important. In regard to the mental growth of the premature, recent observations would suggest that after eliminating the

syphilitic and those of known birth injury, tests for intelligence give reactions for prematures quite similar to the reports on other children of the same strata. Statistics are available this year from a study made by Monr in Chicago. In regard to the diagnosis of birth injury, I think we can depend more on cyanosis, twitching, mild forms of convulsions and peculiar types of respiration than on anything else. Klein of Chicago has made a great many studies of the spinal fluid of premature infants. The premature's spinal fluid is xanthochromic normally. It is practically impossible to detect the difference between traumatic fresh blood in the spinal fluid and that following the birth hemorrhage.

Let me reiterate that we must bear in mind that cyanosis is caused more commonly by birth injury than by congenital heart disease. Many infants with congenital heart disease will be cyanotic, but in most instances they are not of abnormal color. Alpha-nobelin is of some value in restoring respirations, but has its dangers in over-dosage. 1-40 gr. is the correct dose, and it should not be repeated frequently. A mixture of carbon dioxide and oxygen is helpful in promoting respirations.

Let me again thank this Society for their kind attention in the presentation of this paper.

## SYMPOSIUM: LOBAR PNEUMONIA THE DIAGNOSIS OF LOBAR PNEUMONIA\*

J. MURRAY KINSMAN, M. D.

Louisville.

The problem of diagnosis in lobar pneumonia naturally divides itself into three parts: (1) The determination of the fact that the patient has lobar pneumonia rather than some other disease; (2) the identification of the causative organism is order that proper specific treatment may be instituted, if available, and (3) the recognition and evaluation of certain factors upon which a reasonable prognosis can be based.

We are, all of us, only too familiar with the classical picture of lobar pneumonia to benefit from a mere discussion and elaboration of the symptoms and signs of that ubiquitous disease. Even the most ignorant man-in-the-street fears pneumonia when he suddenly develops a pain in the side of his chest, a chill, feverishness and cough—especially if he has had a cold for a few days previously. And if he begins to expectorate thick, bloody sputum, his worst fears are confirmed. When we first see this patient, he is apt to appear very ill, with a worried, drawn expression, perhaps with herpes on his lips, dilatation of the alae nasi with respiration, and possibly

\*Read before the Jefferson County Medical Society.

cyanosis. His temperature, pulse and respirations will be elevated. And, upon examining his chest, we will probably find decreased expansion of one side with a dull note, increased vocal fremitus and blowing or tubular breathing with perhaps a few crepitant rales. Our diagnosis is, of course, confirmed at once, for that is the typical picture of lobar pneumonia.

In a public hospital, where the patient is usually brought in only when the condition is fully developed, it is this typical condition that is usually seen. But in private practice, the doctor usually sees the patient very early in the illness, or perhaps he has been treating him in the meantime for his cold and he has suddenly developed a chill. It is in such cases before consolidation has fully developed, that diagnostic acumen is needed. It may not be amiss, therefore, to go into somewhat more detail concerning the signs and symptoms to be elicited at this stage:

The age, sex and race of the patient are of no help whatsoever, for pneumonia is no respecter of persons.

It will be noted that in general the figures from the two sources agree fairly closely, the greatest discrepancy appearing in the age groups, where the City Hospital series showed a large proportion of cases occurring in middle life. Three-quarters of the cases occurred in males and one-quarter in females two-thirds were colored and one-third white.

**Symptoms:** The mode of onset of symptoms is of great importance. In 1,276 collected cases, 80 per cent began suddenly and 20 per cent insidiously. The initial symptoms are of importance because of their relative constancy.

A chill, either a true rigor or a feeling of chilliness, occurs in over 50 per cent of cases. The temperature, of course, rises during the chill.

Pain in the side of the chest is extremely common, occurring, according to one writer, in 90 per cent of cases. The pain is caused by the co-incidental pleurisy and is of the "stitch in the side" type. Paradoxically, the pain may be located on the contralateral side from the pneumonic consolidation. Moreover, it is not infrequently located in the upper abdomen (7.7% in 658 cases—Chatard) and more rarely in the lower so that as common knowledge shows, these patients are occasionally operated on for some acute intra-abdominal lesion. The detection of a friction rub over the affected area, the increase in pain by moderate pressure and its amelioration or cessation by pressure firmly applied to immobilize that portion of the chest, as by the application of adhesive strips—these are important points in helping to establish that

the pain is pleural and not peritoneal in origin.

Dyspnea makes its appearance early, chiefly as a result of toxemia, but exaggerated by the necessity for shallow breathing occasioned by the pleural pain.

If there has been a bronchitis, cough will have been present before the onset of the pneumonia; if not, it usually develops very quickly—sometimes as soon as the paroxysm or rigor is over. At first it is dry and unproductive, and extremely painful; later, expectoration appears and the cough may partially abate. But it is to be emphasized that in the beginning it may be entirely unproductive.

The sputum is at first scanty, frothy, white or streaked faintly with blood. In a few hours it becomes frankly blood-streaked and rusty. It is thick, viscid and tenacious, and difficult to cough up. Cecil (2) says that rusty sputum occurs only in lobar pneumonia and is pathognomonic of that condition, but other authors and my own observations lead me to believe that it can occur also in bronchopneumonia, and that the finding of rusty sputum, while very strong evidence that we are dealing with a case of lobar pneumonia, does not establish the diagnosis beyond question. It is of interest to inquire as to what percentage of patients with lobar pneumonia have rusty or bloody sputum.

Analysis of 125 cases admitted to the Louisville City Hospital for year 1930-31 shows that 75% of them have rusty or bloody sputum. This is a little higher percentage than usually given.

**Signs:** Now, what are the earliest physical signs of lobar pneumonia? The patient usually appears quite ill early in the disease, although many patients, especially among the negroes, may never exhibit the characteristic prostration. The respiratory rate is apt to be increased and "catchy" in character. Herpes occurs in about one case in five (21.2 per cent of 4,447 collected cases—Norris & Farley). Cyanosis does not develop until consolidation has set in.

During the early stage of the disease, the pathological picture in the lungs is one of congestion, with loss of elasticity of the alveolar walls and consequent dilatation of the alveoli, which may contain some serum and blood cells. During this stage, there may be noticed some lagging or impairment of motion on the affected side. The percussion note at this time is not dull or impaired, but is apt to be hyper-resonant or even almost tympanitic, due to the "resonance chamber" effect of the stretched alveolar sacs. The increase in resonance may be so marked that the site of consolidation may be thought to



be on the sound side, due to the relatively less resonance on that side. Dullness does not develop until true consolidation becomes definite.

On auscultation the earliest definite sign is not blowing breathing, but suppression or diminution of the normal vesicular murmur, which becomes more and more bronchial in character and gradually louder as consolidation develops. The suppression of the breath sounds at the beginning is very common and occasionally persists throughout the attack.

Vocal resonance and fremitus parallel the breath sounds, being present when they are tubular in character and absent when they are suppressed.

The most constant and most suggestive sign of early pneumonia is the hearing of fine crepitant rales. These rales were first described by Laennec and although not pathognomonic of pneumonia, are yet very suggestive, especially if they are heard at the bases. They occur toward the end of inspiration and are apt to occur in showers. Later, as the breath sounds assume a tubular quality, they tend to disappear, and during the stage of consolidation are usually not heard at all.

One other sign frequently heard on auscultation is the friction rub (mentioned above) which so frequently accompanies the dry pleurisy of the onset. This may be present at a very early stage.

There are certain cases of pneumonia in which no physical signs can be elicited at all, because of the fact that it is the central portions of the lung which are involved. To this is given the name of "Central Pneumonia." The diagnosis may be suspected because of the typical symptoms and the absence of physical signs, but x-ray evidence is necessary to establish the diagnosis. As a matter of fact, it is quite generally accepted that all pneumonias begin centrally and extend toward the periphery. A central pneumonia, then, simply represents a condition where the involvement has been arrested before the inflammatory reaction reaches the periphery of the lung, and differs from the usual form in no other important respect.

A diagnosis of lobar pneumonia, then, may be made shortly after the onset, upon a history of a sudden chill, with fever, a dry cough, pain in the chest and prostration; and upon the finding on examination of an acutely ill patient, with some dyspnea or a rapid respiratory rate, slight impairment of motion of one side of the chest, slight to moderate hyper-resonance on percussion, distant breath sounds, fine crepitant rales, and perhaps a friction rub.

Of course there are many other factors which may help to corroborate the diagnosis,

such as tachycardia, nose bleed, leukocytosis of the polymorphonuclear type, etc., but since these occur in many other types of infection, their diagnostic value is rather incidental. They do help, however in distinguishing pneumonia from such infections as typhoid fever and influenza, for example.

Tuberculosis may be confused with pneumonia, but its less sudden onset, its tendency to involve the upper rather than the lower portions of the lung, and its lower white count with a lymphocytic tendency, help in ruling it out.

Pleural effusion is probably the one condition which presents the greatest difficulty in differential diagnosis. Although theoretically, the two conditions have quite different symptoms and signs, yet in practice one finds atypical cases of both which simulate the other almost exactly. X-rays, the leukocyte count and exploratory tap may be of value, but the most important factor is the finding of pneumococci in the sputum. Of physical signs I am convinced that the percussion note is the only one to be relied upon, the flat note of fluid with the feeling of resistance it imparts to the finger being sometimes quite easily distinguishable from the dullness and non-resistance of consolidation.

It must be noted, though, that not infrequently a correct differential diagnosis can be arrived at only by observing the course of the disease, or by an examination of the sputum.

The diagnosis in lobar pneumonia is not completed only by establishing that the patient has pneumonia and by designating which portions of the lungs are involved. For purposes of rational treatment, the determination of the causative organism is also necessary. Although a not inconsiderable number of cases of pneumonia are caused by the streptococcus, a few by such organisms as the staphylococcus, Friedlander's bacillus, etc., and especially during epidemic periods, many by the influenza bacillus, yet in the great majority of cases, the pneumococcus is the offending agent. And, although the treatment of the former kinds is largely symptomatic, yet because the treatment of the pneumococci kind is specific for certain types of the organism, an effort should be made to determine not only the organism present, but its type, if it is a pneumococcus. Now, there is a septicemia in many of the cases, and the organisms can be cultured from the blood-stream. But this requires considerable time, during which the patient might have been receiving the valuable effects of appropriate serum. A more rapid and the more usual method is to use the sputum as soon as any appears. This is injected into the peritoneal

cavity of a white mouse from which, after six or eight hours a pure culture of pneumococci can be obtained. This can then be typed within an hour, so that the type may be known within seven to nine hours after the sputum is first collected. Many laboratories wait ten or twelve hours before killing the mouse, but six hours is usually quite long enough, and many of the mice die within this time anyway.

Recently two other methods have been developed to shorten the time required for typing. Of these, the more rapid is the Krumwiede method (3) which involves the preparation of the specific antigen direct from the pneumococci present in the sputum itself. The sputum is treated with certain reagents until a clear solution is obtained. This solution is supposed to contain the antigenic portions of the pneumococci present in the sputum. This solution is then added direct to the appropriate sera and the reaction is obtained within a few minutes. Obviously this method will give positive results only if the sputum contains a relative large number of pneumococci. The total time required may be less than one hour.

The other rapid method is known as the Sabin method. (4.) In this, drops of peritoneal exudate are taken from the peritoneal cavity of the injected mouse from two to five hours after injection and mixed with the appropriate sera and the reaction noted microscopically. Cecil and Russell have recently reported the results of the use of these two methods in the typing of their Type II pneumonia cases at the Bellevue Hospital for the hospital year 1930-1931. During this time there were 58 cases of the Type II pneumonia as determined by the typing of the organism obtained from the heart's blood of the injected white mouse. Their procedure was to inject the mouse routinely, then to try the Krumwiede method direct on the sputum and then to check it with the Sabin method. The results are as follows: Of the 58 cases, 28 were positive with the Krumwiede method, and of these 25 were sharply positive; therefore, 43% of the 58 cases were definitely typed in less than one hour. Of the 58 cases, 52, or 90% were positive with either the Krumwiede or the Sabin method within five hours. The Krumwiede method gave no false reactions and the Sabin method only two. Therefore, it is apparent that by the use of these methods the type of infecting organism should be known within five hours in about nine-tenths of the cases.

Cecil and Russell (5) also point out that if the patient is unable to raise sputum, typing may still be done in most cases by swabbing the pharynx, culturing in broth for two

hours and then injecting 1 cc. into a mouse, following which the microscopic or macroscopic agglutination tests may be done in the usual manner.

A more rapid but less certain method of typing lies in the employment of the precipitation reaction on the patient's urine. The urine contains certain bodies which, when present in sufficient concentration, may be precipitated by the addition of serum. The test is too inconstant to be of great value, being definite only in very severely ill cases.

(3) The diagnosis is finally completed only when the factors upon which a reasonable prognosis can be based are obtained and evaluated. Of these there are many, some important, some less important. Of the important factors there are three which stand out above the others. These are (1) the presence or absence of bacteremia. The importance of this factor in prognosis has perhaps not been fully realized.

In a recent paper by Cecil and Russell (5), they state that of their Type I cases there was a bacteremia in 29.7%, with a corresponding mortality rate of 28.2%; whereas in their Type II cases there was a bacteremia in 51.1% and a mortality rate of 48.8%.

The close relationship between the percentage figures for bacteremia and mortality rate is quite evident. They also present figures to illustrate the separate mortality rates in comparison with bacteremia in Types I and II which received no serum. These are as follows:

	Type I		Type II	
	No. Cases	Mortality %	No. Cases	Mortality %
Bacteremia . . . .	45	66.7	64	87.5
No bacteremia . .	80	22.5	71	8.5

This shows even more strikingly than the first table the tremendous effect upon the outcome of the presence of a bacteremia.

The type of pneumococcus causing the infection is of very great importance also. It has been recognized for years that the mortality rate is much higher for pneumococcus of the Type III variety than for any of the other types. The least dangerous are Types I and IV.

The extent of the consolidation plays a definite part in the outcome. The greater the extent—that is, the more the number of lobes involved—the graver the prognosis. This is shown in Table V. A progressive or "jumping pneumonia" where the consolidation spreads as the disease advances is a serious feature. There appears to be no special significance attached to the involvement of any one individual lobe, however.



## Mortality Rates According to Extent of Involvement

	L. C. H.		Norris & Farley (1)		Cecil (2)	
	Cases	Mortality %	Cases	Mortality %		
One Lobe . . . .	74	39.2	590	31.00		
Two Lobes . . . .	29	58.6	233	38.2		
Three Lobes . . . .	18	44.4	99	59.0		
Four Lobes . . . .	1	100.0	8	62.5		
Five Lobes . . . .	0	0	1	100.0		
One Lobe . . . .	74	39.2	590	31.0	—20.9	
More than One Lobe . . . .	48	54.2	341		—40.0	

A factor of somewhat lesser importance is the age of the patient. The extremes of life are generally supposed to be the more dangerous age periods for pneumonia. The Louisville City Hospital figures do not bear this fact out. Other figures are not immediately available for comparison. The statistics for race, however, rather surprisingly show only a slightly greater mortality rate among the negroes than among the whites. Of other factors of more or less importance, the height of the temperature, the white blood count, and the respiratory rate in themselves may have little significance, according to the Louisville City Hospital analysis. One reading of the blood pressure or, for that matter, of the pulse rate is not in itself sufficient upon which to base a reasonable prognosis. Rather, the trend of these factors is much more important. A rising pulse rate and a falling blood pressure have for many years been considered to be a bad prognostic sign.

In general, prognosis in lobar pneumonia is always at best a rather hazardous procedure and while certain things, such as the type of organism, the presence or absence of bacteremia, and the extent of involvement are, in themselves, of definite significance, yet there are so many factors to be taken into consideration that it is almost impossible to foretell with certainty whether or not a given case will recover or die. After all, until the crisis has occurred, no one can be quite sure what will happen.

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## AN EVALUATION OF SOME NEWER METHODS IN THE TREATMENT OF LOBAR PNEUMONIA\*

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The mortality rate in lobar pneumonia is such that any measures offering prospects of reducing the number of deaths must be considered seriously and without prejudice. Lord Dawson of Penn (1) quotes Fox as saying seventy years ago that the question of the treatment of pneumonia is the "field of battle between the advocates on the one side of 'heroic' measures, and the supporters of a 'rational' or 'expectant' treatment on the other"; and a similar conflict is being waged at present.

It will be impossible to discuss all the newer ideas of pneumonia treatment in this paper, and attention will be directed chiefly to diathermy, oxygen and serum therapy. However, the more recent work on the use of digitalis is interesting. Roentgen studies (2) have shown cardiac dilatation in 62% of patients with lobar pneumonia; and daily electrocardiographic studies on 45 cases (3) revealed transient changes, considered indicative of myocardial involvement in 93%. These changes might be considered as indications for digitalis, but the work of Wycoff and his associates (4) in digitalizing alternate cases showed a higher mortality in the patients given digitalis, even in the presence of auricular fibrillation. In spite of these figures they recommend the use of digitalis when indicated in the individual case. The use of ethylhydrocupreine and of various bile salts which have selective action on pneumococci in the laboratory must be further studied in their application to pneumonia. Pneumococcus vaccines have by no means been entirely cast into the discard, and merit additional study.

## DIATHERMY

Diathermy has been widely used in pneumonia, and a great many men, both in this country and in England particularly, have reported good results. None claim it to be specific, and its beneficial action is presumed to lie in the production of hyperemia at the site of the pathological process, resulting in local concentration of serum antibodies, and of increased local heat which will accelerate enzyme activity in liquifying the exudate (5). The current between two electrodes on opposite sides of the body does not take the shortest path, but a good deal travels near the surface, not traversing the pneumonic area. As it is at present not feasible to introduce one electrode into a bronchus and produce local

\*Read before the Jefferson County Medical Society.

concentration of current the best that can be done is to use the smaller of two electrodes directly over the consolidated area and bring about a convergence of current from the larger. The customary strength of current is 60-70 milliamperes per square inch of electrode, given for twenty to forty minutes every four to twelve hours. Treatments are best begun early, and in this stage are said by their proponents to abort the disease in many instances, though reliable statistics to support this claim are lacking. Clement (6) advises against starting diathermy after forty-eight hours in most cases. Freeland (7) strongly recommends intensive treatment during the stage of congestion, but during hepatization suggests that the consolidated area be avoided, as absorption may be increased and the chances of bacteremia enhanced. At this time treatment may be given over the normal lung, and when resolution begins, again directed to the pneumonic portion. This concept is not entertained by all, however; and most of those experienced with diathermy regard empyema as the chief contraindication.

The reported cases treated by diathermy constitute a heterogeneous group of various types of pneumonia, making it difficult to determine whether mortality has been reduced by this form of therapy. There seems to be no doubt that in proper hands it can do little harm, and does make the patients more comfortable. Pleuritic pain is usually relieved without the use of constricting binders or large doses of opiates, and a soporific action is exerted. It may be used in conjunction with other forms of treatment, and there is no necessity for delay in typing or fear of allergic reaction as with serum therapy. Stewart (8) reports the fall of temperature by lysis in 97% of 370 cases, and Robinson (9) had a mortality of only 11.2% in 89 cases given diathermy. Seybold (10) gives a mortality rate of 16.4% in 105 cases of pneumonia resulting from "exposure" as distinguished from a series of post-operative cases with 14.3% death rate.

The oxygen treatment of pneumonia is based on a series of observations beginning with a study of mountain sickness produced by atmospheres of low oxygen tension, with cyanosis, restlessness, increased breathing, dizziness and cerebral symptoms not unlike those seen in severe pneumonia. Study of arterial blood in pneumonia (11) revealed 60-90% utilization of oxygen capacity instead of the normal 95%. It was pointed out by Stadie that the degree of oxygen unsaturation is of prognostic value and proportional to the degree of cyanosis. He stated that patients with an unsaturation greater than 20% rarely survived. It was found possible by proper methods of administration to restore

the oxygen saturation to nearly normal levels in many cases, though some did not respond. (12) Barach (13) determined that oxygen concentrations of inspired air below 70% were harmless even for long periods, and that concentrations below 30% were practically useless therapeutically.

All who have had wide experience with oxygen note definite symptomatic relief following its use. Cyanosis is often dramatically relieved, patients are less restless, and breathe easier. The pulse is slowed and blood pressure is better maintained. However, the effect on the mortality rate is by no means striking. An important reason for this is that in the past only the most serious cases have been given oxygen. It can in no way be considered specific, but is a palliative, which may take enough load from the patient's cardio-respiratory system to allow him to survive to develop or be given antibodies enabling him to successfully fight the pneumococcus. Haldane (14) pointed out that the body is not like a machine when damaged, but tends to revert to normal, and any respite offered is utilized for recuperation.

An important observation in favor of oxygen therapy is that frequently made when a patient comfortable in high oxygen concentration is suddenly put into normal air, with rapid development of cyanosis, dyspnoea and collapse, and subsequent relief on being returned to oxygen.

The methods of oxygen administration are familiar. The funnel has fallen into well-deserved disuse, as it does not perceptibly increase the oxygen in the nasopharynx. The nasal catheter serves a useful function in relatively mild cases and as an emergency measure. With the catheter, the inspired air may be made to contain 30% oxygen (15) at a flow of two liters per minute, and the percentage is greater when a Y-tube and two catheters are used. The catheter should have several perforations near the tip, and be frequently cleansed to prevent accumulation of mucus. Patients not infrequently object to the catheter, and if delirious, may pull it out of the nose. Various masks and types of re-breathing apparatus have been devised by Haldane and others which give satisfactory oxygen concentrations, but produce a sense of suffocation.

The pneumonia tent was first suggested by Leonard Hill (16) and further developed by Barach and Binger (17). Cecil and Plummer (18) and others in this country. The patient's head and shoulders are enclosed in a tent of rubberized fabric tucked between the bedclothes to diminish leakage. A circulation of air should be maintained to keep the humidity 35-50% (19) and allow the patient to



lose heat by evaporation. Circulation may be kept up by the inflow of oxygen under pressure as in the Cecil-Plummer tent, or by a motor as in the Barach type. One objection to the motor has recently been removed by encasing it in a sound-proof box. By allowing the air to pass over ice it is kept at a temperature of 63-68 degrees F. and a good deal of the moisture is condensed. The use of soda-lime to absorb carbon dioxide excreted by the patient has recently been abandoned. Unlike oxygen,  $\text{CO}_2$  diffuses rapidly through the rubberized fabric; some is absorbed by the waater from the melting ice, and a great deal is washed out by the constant inflow and resultant leakage of oxygen. Rosenbluth and Block (20) found that careful nursing was required to keep the oxygen in a tent at 45% with an inflow of less than 8 liters per minute, and with that amount of flow the  $\text{CO}_2$  level did not rise above 1-1.5% which apparently did no harm.

Barach (21) has also devised a portable oxygen chamber which admits two beds, and is really nothing more than a large tent. It has the additional advantages of an air filter which will remove pollen and bacteria from the air making the tent useful in the treatment of pollen sensitization and minimizing the chances of cross infection between two patients in the same tent. Several large oxygen chambers in the country are being constantly used, and giving very satisfactory results.

In experimental pneumonia specific immune serum is effective therapeutically, as shown by Cecil and Blake (22) in monkeys, and Goodner (23) in rabbits. The serum contains agglutinins, precipitins opsonins and other protective antibacterial antibodies, rather than antitoxin as in the case of tetanus. However it has a neutralizing effect on the specific soluble carbohydrate shown by Avery and Heidelberger (24) to be elaborated in the capsule of the pneumococcus and responsible for its virulence. Bull (25) found that serum caused clumping of pneumococci present in the blood stream within five minutes after injection, and that clumps were later removed from the blood and phagocytized in the lungs, liver and spleen. Another important observation was that if too large a dose of serum was given, enormous clumps of cocci formed, resulting in emboli to the lungs and brain. Antibodies may be demonstrated in the blood stream after serum is given in amount sufficient to over-neutralize the toxic products of the pneumococcus: these are the same antibodies found by Dochez (26) in patients at the time of crisis, and usually absent in fatal cases.

The type of pneumococcus producing the

disease is of primary importance from the standpoint of prognosis and treatment. Neufeld and Handel (27) recognized that various types existed, but Dochez and Gillespie (28) made the first real progress in separating Types I, II, and III from the heterogenous Group IV. Cooper (29) and her associates have recently been able to differentiate twenty-one or more well defined sub-types in Group IV.

Typing is usually done from sputum, which should be obtained at the earliest opportunity. Palfrey (30) suggests carrying a sterile bottle to be left for collection of sputum at the first visit. If no sputum is obtained, pharyngeal swabbings may be mulsified in saline. Lung puncture has been successfully used to obtain a culture by Stewart (31). The material obtained may be inoculated on Avery's medium or preferably injected into the peritoneal cavity of a mouse. Peritoneal exudate may be removed 2-6 hours after injection for microscopic agglutination by the methods of Sabin (32) or Calder (33), both of which have checked up quite satisfactorily with the test tube reactions done after the death of the mouse. Blood culture should be routine to confirm the sputum typing, as well as for prognostic reasons. Baldwin and Cecil (34) report a 78.3% mortality in cases with positive blood culture, and 10% with sterile blood. Cruickshank (35) typed his cases by injecting polyvalent Types I and II serum, and later determining if agglutinins for either type had been absorbed by toxic material from organisms of that type.

Unconcentrated immune horse serum has been given a thorough trial in lobar pneumonia, and some good results have been obtained, especially by Cole (36) at the Rockefeller Institute. He found the serum most satisfactory in Type I cases, less so in Type II and of little or no avail in the other types. The opinion is unanimous that early administration offers the best chances of success and Wadsworth (37) and Locke (38) consider it practically useless when given later than the third day. The statistics presented showing the results of treatment with unconcentrated serum are interesting, but in the majority of instances not well controlled.

Wadsworth's cases were collected from all over the country, treated by a number of different men, though with known potent New York State serum. Cole's cases were all treated in the Rockefeller Hospital and his opinion was that the mortality had been reduced almost to the minimum, which might be reasonably expected, due to complications and other systematic concurrent disease; unfortunately, he had no controls. Locke's series

TABLE I  
TYPE I PNEUMONIA—TREATED WITH UNCONCENTRATED SERUM.

Author	Date	Treated			Controls			Treated 72 hours			Controls		
		No.	Deaths	%	No.	Deaths	%	No.	Deaths	%	No.	Deaths	%
Locke	1923	145	30	17.2	71	12	16.9	12	0	0	13	4	30.8
Civil	"	353	68	19.3	..	..	...	57	7	12.3			
Military	"	358	35	9.5	..	..	...						
Wadsworth	1924	445	57	12.8	362	72	19.8						
*Misc.	"	151	33	21.9	218	41	18.8						
*One City	"	126	17	13.6	126	24	19.0						
*Military	"	168	7	4.2	18	7	39.0						
Cole	1929	371	39	10.5									
Litchenstein (39)													
	1929	21	2	9.5									

at the Boston City Hospital seem to have been adequately controlled.

The average dosage of unconcentrated serum which may be relied on to leave an excess of antibodies in the blood is 200-800cc, given in 100cc amounts intravenously. The introduction of this amount of foreign protein creates the danger of immediate and delayed allergic reaction, and though death is infrequent, the severity of the reaction may be such as to turn the tide in the wrong direction in a patient who is gravely ill. Serum sickness occurs in 53-95%.

For a number of years efforts have been made to concentrate the serum. Huntton (40) developed a method of extracting the antibodies based on the work of Chickering and Gay (41) by combining them with pneumococci of the same type, and later disassociating this combination. Cecil and Larsen (42) reported results with Huntton's antibody solution which were comparable to those with unconcentrated serum, but severe reactions were frequent and sometimes fatal when a dose large enough to be efficacious was given. It has been thought by many that the good results obtained with Huntton's solution were due to the non-specific-protein type of reaction so frequently induced. One fact in favor of this contention is that the mortality in Group IV cases was reduced, even though there were no specific anti-bodies for this group in the solution.

Felton (43) has produced a satisfactory concentrate, and Banzhaf (44) did successful work along the same lines at the New York Board of Health. Felton found that the specific antibodies are almost wholly in the water-insoluble globulin fraction of the serum, and could be separated by diluting the serum with 10-15 volumes of water, and re-dissolving the precipitate in saline. Modifications in technique have been introduced, the latest being the precipitation by alcohol at a low temperature (45). Felton also demonstrated that the portion of serum causing reactions

was not identical with the fraction containing the antibodies, and separated the fractions by acid precipitation. By these methods of purification and concentration, a material of remarkable potency has been developed. Its antibody content is at least ten times that of unconcentrated serum (46) and in mice its protective action against pneumococci is 100,000 times that of optochin, and 1,000,000 times that of quinine.

One of the disadvantages of Felton's serum is its cost, part of which goes to pay for its standardization, by measurement of protective action against virulent pneumococci in large numbers of mice. Felton (47) and others (48) have recently found that the antibody content may be as accurately measured by agglutination and other immune reactions less expensively performed than mouse protection tests. Drying of the concentrate has also been found possible without loss of potency and may be used to facilitate transportation and diminish contamination.

Potent sera have been produced by Felton's method against Types I and II pneumococci, and against several of the types composing Group IV. A polyvalent I and II serum is satisfactorily used before typing is complete to obtain the advantage of early treatment. After typing is reported, shift may be made to the specific type serum. No satisfactory serum has yet been produced against Type III, though hopeful work is in progress.

Precautions must be taken before injection of either whole or concentrated serum to avoid unfortunate allergic reactions. Patients must be questioned as to history of hay fever, asthma, urticaria or previous horse serum injections, and ophthalmic and intracutaneous tests made with 1:10 dilutions of serum to determine sensitivity. If history or tests suggests an allergic background, serum must be withheld, or given with caution. In suspicious cases, adrenalin is best given with serum (Waldrott, 49) instead of waiting to see if a reaction develops.



The usual serum dosage is 20,000 -100,000 units in the first twenty-four hours, in divided doses every 2-8 hours, depending on the reaction of the patient, and further treatment is determined in the same way. Due to the remarkable concentrations, the average individual dose need be only 10-40cc., simplifying the procedure. It has recently been suggested that serum be given until an excess of specific antibody can be demonstrated in the blood (50) showing that neutralization of the specific soluble substance of the invading pneumococcus is complete.

Reactions with concentrated antibody, immediate or delayed, occur in only 5-20% of cases and with greater purification the percentage is rapidly diminishing. The earlier serum is given, the more effectual it will be. As Cecil remarks: "There is no more striking effect in the whole domain of specific therapy than that which frequently follows the early administration of Felton's serum in Type I pneumonia."

Though reduction in the mortality of Type I cases is most striking, it is important to note the frequency with which blood stream infections in Type II pneumonia are cleared up. Cecil, Baldwin and Larsen (51) in 326 cases found the blood cultures positive in 26.4% of Type I, and in 39.7% of Type II; the latter percentage being greater than in any other type. Cecil and Plummer (66) report a mortality of 88% in their septic control group, and 69% in serum treated cases with positive blood culture. They also noted that the treated cases which recovered had shown an average colony count of 35 per cc., while the recovered controls averaged only 11 colonies per cc., demonstrating the serum to be effective even in some cases of marked bacteremia. Fleming (52) of Glasgow considers the main value of serum to be that of keeping the blood culture sterile.

All careful observers who have used Felton's serum have found it to shorten the

course of the disease from 1-2 days at least, and that extension of the pneumonic process is infrequent following the administration of serum. The effect on the incidence of complications is, however, very little.

The following tables illustrate the results obtained with Felton's serum in Types I and II pneumonia in essentially all the reported series that are well studied or controlled. One of the most important conclusions to be drawn from the figures is the benefit of early serotherapy.

In evaluating the results of serotherapy, several facts must be borne in mind. Lobar pneumonia is a self-limited disease, frequently ending by crisis, with virulence varying from year to year, and mortality affected by age, alcoholism and complicating diseases. Infection produced by different types of pneumococci runs different courses. It is probable that mortality is affected by the character of nursing and medical care, and by the use of oxygen and other supportive measures. Control groups for comparison must be carefully selected, preferably by the alternate case method.

In contemplating the use of serum, difficulties and possible delay in bacteriologic diagnosis must be considered. This can be partly offset by using polyvalent serum in all cases of definite lobar pneumonia as early as diagnosis is made, as over 50% will fall into Types I or II and will derive benefit from the mixed serum. Potency of the serum must be known, and the definite though slight difficulties of frequent intravenous injections weighed. In a patient with previous allergic manifestations, the use of serum may be contraindicated.

Schottmuller (62) suggested the use of convalescent serum in the treatment of pneumonia because of the diminished danger of reaction, and because Tillet (63) showed that homologous serum in animals was more effective than that obtained from some other

TABLE II  
TYPE I PNEUMONIA FELTON'S SERUM

			TREATED			CONTROLS			TREATED 72 HRS.			CONTROLS 72 HRS.		
			Cases	Deaths	%	Cases	Deaths	%	Cases	Deaths	%	Cases	Deaths	%
Park	Bullowa	Rosenbluth (53)	109	18	17.0	105	33	31.0	29	6	21.0	28	10	36.0
Cecil & Plummer (54)			239	48	20.1	234	73	31.2	103	12	11.7	97	26	26.8
Finland (55)			80	17	21.3	70	22	31.4	22	4	9.5	16	6	37.5
Edinburgh (56)			12	0	0	17	5	29.4						
Glasgow (57)			15	1	6.6									
Sutliff and Finland (58)			28	7	25.0	31	10	32.2						
Lord (59)			99	20	20.2	93	23	24.7	32	3	9.3			
Bigelow (60)			86	18	20.9									
Baldwin (61)			19	1	5.2	20	5	25.0						
			667	130	19.4%	570	171	30.0%	206	25	12.1%	141	22	29.8%

TABLE 111  
 TYPE II PNEUMONIA—FELTON'S SERUM

	TREATED			CONTROLS			TREATED 72 HRS.			CONTROLS 72 HRS.		
	Cases	Deaths	%	Cases	Deaths	%	Cases	Deaths	%	Cases	Deaths	%
Finland (55).....	39	11	28.2	32	11	34.4						
Park, Bullowa Rosenbluth (53) 56	13		23.0	61	18	30.0						
Baldwin (61).....	35	9	25.7	29	15	51.7						
Cecil-Plummer (66).....	252	102	40.5	253	116	45.8	21	3	14.3	20	13	65.0
	382	135	35.3%	375	160	42.6%						

kind of animal. Beebe and Sutliff (64) used convalescent serum in two cases of Type II and one of Type III pneumonia on the third and fourth days without demonstrable effect, and Barach and Soroka (65) transfused 1000-1600cc. of antibody containing blood from donors immunized with pneumococci without effect in eight patients.

#### CONCLUSIONS

1. Digitalis should not be given routinely, but only for specific indications.
2. Diathermy and oxygen properly administered in lobar pneumonia frequently give symptomatic relief and may reduce mortality.
3. Concentrated antipneumococcus serum given early and in adequate dosage in Type I and II and some group IV cases is of proven value in shortening the disease and reducing mortality by approximately one-third.

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## COMPLICATION OF LOBAR PNEUMONIA\*

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In our handling of the Pneumonias, we are dealing with one of the most acute problems in acute infectious diseases. There are few, if any, acute infectious diseases in which the physician feels his responsibility, and I might say helplessness, as he does in pneumonia. Even with all our newer knowledge of bacteriological findings and with our constant endeavor to develop a worthwhile dependable serum or bacterine, we have made but little progress, although by the use of Felton's Serum or Huntoon's Pneumococci Anti-Body Solution of the various types of Pneumococci, the death rate of all types has been reduced from 39 per cent to 24 per cent. The various types:

- Type 1.....26 to 17 per cent.  
Type 2.....55 to 38 per cent.  
Type 3.....47 to 57 per cent.  
Type 4.....25 to 17 per cent.

As you will notice, the death rate increased in type 3.

The above prologue, while not falling within the title of my paper, is given to impress the seriousness of any type of Pneumonia with or without complications. In addition, there is a well based opinion that the use of Felton's Serum or Huntoon's Anti-Body Solution not only lowers mortality to a certain degree but also lessens the incidence of the more serious complications.

The true complications of pneumonia as shown by Musser and Norris, are really expressions of the pneumococci infection in other organs and tissues than in the lungs. It

is interesting to give you their report of the frequency of complications from clinical observations.

Complications.	Total Cases	No. with	Pct.
Albuminuria .....	4,792	2,184	45.58
Pleural effusion ....	24,511	1,535	6.26
Chronic Nephritis ...	7,080	193	2.73
Empyema .....	13,500	303	2.2
Jaundice .....	22,544	373	1.65
Acute Nephritis ....	30,042	307	1.22
Abscess of Lung ....	12,030	70	0.63
Acute Arthritis ....	28,645	150	0.50
Acute Endocarditis ..	32,349	144	0.44
Acute Meningitis ...	49,028	206	0.42

Other clinical complications that are frequently met with are Acute Dilatation of the Stomach, which is a serious complication of pneumonia and a source of great danger. When it arises suddenly during the height of the disease it may promptly lead to death. Another frequent complication, usually at the height of the disease and sometimes following the febrile period, is hiccough. This is a distressing complication but is ordinarily successfully handled. I have seen a number of these cases.

Another complication that we see not infrequently is the so-called "Delayed Resolution" or "Un-resolved Pneumonia." I have recently seen a very interesting case of this type.

It is also interesting to give you Musser & Norris Autopsy Records of other series.

Complications.	Total Cases.	No. With	Pct.
Pleural effusion .....	974	405	41.58
Nephritis (acute) ...	7,020	1,334	19.00
Nephritis (chronic) ..	2,218	573	25.83
Acute pericarditis ....	2,128	207	12.6
Otitis media .....	54	4	7.41
Acute endocarditis ...	2,693	157	5.8
Gangrene of lung ....	1,914	100	5.2
Empyema .....	973	50	5.1
Acute Meningitis ....	1,833	180	3.5
Abscess of lung .....	1,294	28	2.1
Acute Peritonitis ....	971	21	2.1
Acute Arthritis .....	698	4	0.58
Pulmonary Thrombosis	1,830	5	52.9

Many of the complications of pneumonia are the result of the pneumococcus septicemia, the infection carried either by the lymphatics, or the blood stream. We will consider here only a few of the most common and serious complications.

Of course, the severe toxemia, oxygen hunger and heart failure (cardiac asthenia) and the serious aspect of the crisis are a part and parcel of the original disease, and are not to be considered in the discussion of the complications.

### 1. PLEURISY.

Every case of Pneumonia has more or less circumscribed Pleurisy. In one hundred and twenty autopsies in Pneumonia Norris found

\*Read before the Jefferson County Medical Society,

Pleuritis 59 times (46.4 per cent); fibrinous 23, serous 5, fibrous 11, purulent 20. This complication does not seem to influence the prognosis very markedly. We occasionally find the pleuretic exudate on the opposite side on which the pneumonia existed. I have seen a number of these cases.

## 2. EMPYEMA.

Out of the many thousand cases collected, Empyema occurred clinically in 2.2 per cent, and at autopsy it was found in 5.1 per cent. It is curious that the pneumococcus in the lungs rarely produces suppuration—it does with great frequency when it attacks the serous membrane, such as the pleura or the serous membranes of the joints. Outside of the lung pneumococcus might be considered a suppurative germ, and often times certain strains show positive hemolytic powers. During the epidemic of Flu in 1918 and 1919 we all saw a high per cent of empyema with our pneumonias, and we soon learned that if these cases were operated on early they all died, and if we delayed several weeks longer practically all of them got well.

## 3. ABSCESS AND GANGRENE OF THE LUNG.

Abscess of the lung, to quote Norris statistics again, occurred clinically in 76 among 12,630 cases (0.03 per cent, and at autopsy was found in 28 of 1,294 cases (2.1 per cent) a frequency which by no means can be ignored. Holt states that in 7 per cent of the autopsies upon infants and young children dying of pneumonia abscesses are found. In the past, abscess of the lung, and empyema have been frequently confused and reasonably enough, for the symptoms of the two conditions may be similar, especially if the former is situated near the surface of the lung. Pulmonary abscess develops insiduously, producing no symptoms which are characteristic at first. The sputum is increased in amount and yellow in color, later becoming greenish. At times it may contain a blood pigment, or assume a green or blue color by virtue of chromogenic micro-organisms. In Norris autopsy records, as above shown, gangrene in the lungs occurs at autopsy at 5.2 per cent of the cases. When gangrene begins we find in the sputum, in addition to various pyogenic micro-organisms different saprophytic bacteria through the agency of which necrosis of the pulmonary tissue rapidly occurs. The first symptom is an alteration in the character of the expectoration, which becomes brownish, more liquid and finally prune-juice or chocolate colored. My first diagnosis of gangrene of the lung was made forty (40) years ago, in which the whole lower lobe of the right lung became gangrenous. The patient was radically operated on by the late Dr. Turner Anderson, and lived for many years afterwards. The main hope of

recovery in abscess and gangrene of the lung lies in surgical intervention, for although patients undoubtedly do get well without operation, the number is much smaller in the latter than in the former event.

## 4. ENDOCARDITIS AND PERICARDITIS.

Endocarditis. As Bouillard first pointed out, pneumonia is one of the causes of endocarditis. Since then acute endocarditis has been ascribed to pneumonic infection with the following frequency: Abraham, 1 out of 9; Banti, 8 out of 22; Desse, 14 out of 34; Harbitz, 9 out of 43; Traux, 1 out of 6; Kantschak, and Tickell, 14 out of 84; Lenhartz, 5 out of 38; Osler, 54 out of 209 (ulcerative); Jackson 1 out of 5; Walter 1 out of 21; and Weischelbaum, 6 out of 33. The recognition of acute endocarditis, as you can easily understand, is very readily and frequently overlooked, as many of the most striking physical signs are absent and are so overshadowed by the pulmonary disease, and signs. In a great majority of cases the valves at the base are even affected; thus, as in other diseases, the diastolic murmurs are always suggestive. The prognosis in endocarditis is extremely grave.

In general pneumococcal septicemia you have severe endocarditis in at least 50 per cent of the cases. Referring again to the statistics of Musser and Norris, we find acute pericarditis in 12.6 per cent of their autopsy records. This condition is very difficult to diagnose during life. Even in the great majority of cases it escapes notice until found at autopsy. Infection may occur through the blood or lymphatic streams, but quite often results from direct extension from the infected area of the lung or pleura.

## 5. RENAL SYSTEM

Albuminuria, as in all acute septic diseases, occurs in a large per cent in pneumonia cases. The vast majority of these Albuminurias are transient in character, and accompanied only by a few hyaline casts, epithelial cells and leukocytes; occasionally red cells are found, these representing a higher grade of renal irritation. It is not possible to make a sharp distinction between the so-called "febrile albuminuria" and mild grades of nephritis. In your infectious nephritis the prognosis is generally good. Uraemia and Oedema rarely occur; hematuria is frequently encountered. These cases get entirely well or terminate in death, and very rarely, if ever, terminate in chronic nephritis.

## 6. LIVER.

Again referring to Musser and Norris statistics, Acute Hepatitis was shown in 52.9 per cent of the autopsies. Jaundice with enlargement of the liver is most frequently encountered. Among the theories that have been advanced as to the causative factors of jaundice in hepatitis are the general toxemia, the



venous stasis, stagnation of bile, from the lessened motion of the diaphragm, the pushing down of the diaphragm by the extensive pneumonitis of the right lung,—all play a part. Jaundice itself is not a serious complication in pneumonia, it is like the albuminuria, clears up as the conditions improve.

#### 7. ACUTE DILATATION OF THE STOMACH AND HICCUGH.

These cases, which are easily recognized because of the associated physical signs, demand immediate washing out of the stomach, which should be repeated according to the urgency of the symptoms. The tube may be used, though the patient is found in collapse. The patient may be turned on his side to encourage the emptying of the stomach; this maneuver without lavage is of but little value. Strychnia and eserine salicylate have been recommended, but are of doubtful value. The tube alone gives results.

In these cases in which we find hiccoughs the symptom is exceedingly rebellious to treatment. At times the old fashion remedies, 10 drops each of Hoffman's Anodyne or compound tincture of cardamon, on sugar, slowly swallowed, are effective. In many cases, however, hypodermics of morphine are necessary, with full doses of strontium bromide, and often pheno-barbital.

#### \*X-RAY IN DIAGNOSIS OF LOBAR PNEUMONIA

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Typical uncomplicated lobar pneumonia is diagnosed clinically without roentgenologic aid. In such cases films are often requested and serve a useful purpose in showing the extent and exact location of the consolidation and in furnishing a permanent graphic record to file with the patient's history. The roentgen examination is somewhat similar to a biopsy and affords certain kinds of information which cannot be obtained in any other way during the life of the patient.

A considerable number of pneumonia cases, however, are not typical either as to distribution of the lesion or in clinical manifestations. Central pneumonia or partial consolidation of a lobe may give no physical signs, whereas x-ray films will usually show such consolidations very clearly. In following the course of resolution or the onset of complications roentgen examination is of the greatest value.

Roentgen Findings: The first stage, or stage of congestion, is so transitory, lasting but a few hours, that patients are not often seen by the roentgenologist during this pe-

riod. There is more or less increase in the peribronchial markings as seen in congestion from any cause. There are no specific changes.

In the second and third stages (red and grey hepatization) the consolidated lung casts a dense shadow. A careful examination of the area of increased density and of the surrounding structures will usually reveal certain characteristics which are specifically diagnostic. In this connection it is important to recall the position of the interlobar fissures. The following diagrams will serve to show the essential anatomical relations.

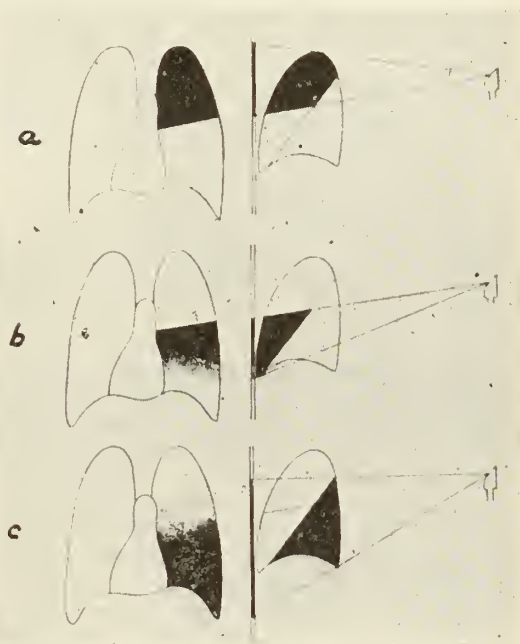


Figure 1. Diagram of the lobes of the lungs to show the relations of the interlobar fissures. From Sante, slightly modified.

The oblique fissure extends downward and forward separating the large lower lobe from the smaller upper and middle lobes. The transverse fissure intercepts the oblique fissure at the root of the lung and separates the upper lobe from the small middle lobe. In a postero-anterior film, with the central ray of the x-ray tube directed through the chest at the level of the fifth or sixth thoracic vertebra, the shadow characteristics will be approximately as shown in fig. 1 (a, b and c).

In upper lobe consolidation the lower margin shows an abrupt sharp line. The middle lobe will present a similar sharp upper margin; but owing to the fact that the middle lobe is wedge-shaped with the apex directed downward along the anterior chest wall, the lower part of the shadow will feather out into normal lung density. The lower lobe, on the other hand, presents an angle both above and

\*Read before the Jefferson County Medical Society, March 7, 1932.

below, and for that reason will have greatest density in the central part of the shadow, feathering to normal lung density above. The feathering at the lower border is not so marked, but usually a considerable amount of light comes through in the costophrenic angle. The right lower lobe is the one most frequently involved.

On the left side the upper lobe takes the place of the right upper and middle lobes.

Owing to the rapid progress of the disease, typical consolidation is usually seen at the first examination. There is no change in the roentgenographic appearance from this date until after the crisis. Resolution normally progresses rapidly and the lungs should be clear in one to two weeks. If dense shadows persist longer than three weeks after the crisis, a complication is indicated. If there is a dense shadow at the periphery, it indicates pleurisy with effusion or empyema; if central, it indicates lung abscess.

In children, lobar pneumonia most frequently begins as a wedge-shaped area of consolidation at the periphery of the upper right lobe, extending rapidly towards the hilus.

**Atypical Pneumonia:** Atypical cases occur most frequently during the milder months of the year. Such cases may show partial consolidation of a lobe, central consolidation, which never extends to the periphery, and gives no physical signs, and migrating pneumonia involving one lobe after another with different stages of the disease existing simultaneously in different lobes.

**Prognosis:** X-ray findings are of no value in estimating the virulence or type of the disease, but will show the number of lobes involved which may be of some value.

**Complications:** X-ray examination is of first importance in determining the presence of complications. Empyema is the most frequent complication. When the presence of fluid is demonstrated the nature of the fluid should be determined by aspiration. Pericarditis with effusion is a less frequent complication (about 1%). Lung abscess is shown by a dense shadow near the hilus which persists after the normal period of resolution. The abscess will not at first show a definite cavity and the margins may be indefinite and hazy. Other less rare complications are atelectasis, endocarditis and chronic interstitial pneumonia.

**Differential Diagnosis:** During the stage of congestion the x-ray findings are not diagnostic, but do indicate that an inflammatory lesion is in progress.

In the stages of consolidation and resolution the following conditions have to be considered:

Empyema, caseous tuberculous pneumonia, lung abscess, pericarditis with effusion, atelectasis, neoplasm, chronic interstitial pneumonia, bronchopneumonia and bronchiectasis.

A detailed discussion of these several conditions is beyond the scope of this paper. Brief mention will be made of some of the more important points.

Empyema is the most frequent complication. Its diagnosis from lower lobe consolidation cannot always be made, roentgenologically. The signs indicating fluid are: complete opacity to x-rays down to the diaphragm and including the costophrenic angle, displacement of trachea and mediastinum, occasionally an abrupt straight line upper margin, and shifting shadow on change in position of patient. Lateral views may help in showing that the opacity does not conform to the size and shape of the lobes of the lung. With a dense shadow and the clinical finding of a flat note over the involved area, diagnostic puncture is indicated.

In caseous tuberculous pneumonia the x-ray findings may be identical. The course of the disease, however, is over months instead of weeks.

Lung abscess usually begins near the hilus and will sooner or later show a cavity with fluid level.

Pericarditis with effusion usually shows diminished cardiac impulse, and water-bottle contour of the cardiac shadow.

Atelectasis causes displacement of the mediastinum, elevation of the diaphragm and retraction of the interspaces, all on the affected side.

Bronchopneumonia produces a roentgenologic appearance which is similar to that of lobar pneumonia during the stage of resolution. However, bronchopneumonia is usually bilateral and does not conform strictly to lobe boundaries.

This covers in a very brief way the more important roentgenologic aspects of lobar pneumonia. In conclusion it should be emphasized that it is the patient's physician who makes the final diagnosis. In all chest conditions, roentgenography furnishes especially valuable information, but the diagnosis covers a great deal more than can be encompassed in any set of laboratory findings. While the x-ray examination may furnish the particular information that is needed to complete the diagnosis, the term x-ray diagnosis is a misnomer and should never be used.

#### DISCUSSION

**J. Rowan Morrison:** I think the Program Committee should be congratulated for having such good papers, bright papers, on such a timely subject and at such a timely time. This has been most interesting to me. I am not go-



ing to say very much, because it is getting late.

Dr. Kinsman's paper on the "Diagnosis of Lobar Pneumonia" I think was excellent. As he stated, the ordinary case of pneumonia seen in the hospital is easy to diagnose by any physician who has ordinary common sense. The reason that there has to be so very many things mentioned in diagnosis is because different doctors will make their diagnosis on one symptom and others on another symptom, just as a man living in the country and being used to handling peaches, apples and melons is able to tell when they are ripe by feeling them, while someone else would have to plug them to find out if they were ripe. Some physicians can tell more by listening and others by feeling.

One of the earliest symptoms which is of importance to me is hyper-resonance rather than dullness, when we see a patient early. In central pneumonia often the only sign is weakness and in distinct respiratory sounds not infrequently accompanied by an inspiratory "grunt."

As regards the typing of pneumonias, I think this is a most excellent thing to do, although here in Louisville we have not found it valuable in many cases to use a serum, although we have determined the type of the pneumonia, because we are not able so far to obtain the serum early enough. I also think that we should do blood cultures to try to determine whether the patient has a bacteremia or not, because as has been shown by Dr. Cecil's paper in the last issue of the American Medical Journal, cases of bacteremia are much more deadly than those that do not have this condition. I saw a beautiful diagnosis of pneumonia made last year by a surgeon. The doctor who called him thought it was appendicitis or gall-bladder disease. A laboratory man made a white count and thought that it was gall-bladder disease rather than appendicitis. (By what means he could tell this I do not know). But the surgeon being well trained in general observations, believed that the patient had a pneumonia, although the pain was in the right side, the base of his left chest did not move as well as the right. He asked for an x-ray examination of the patient's chest and asked me to examine the patient. I made out a beginning pneumonia at the left base, and when the x-ray plate was read it showed that there was a pneumonia at the left base; and patient went on and had a clinical course of pneumonia and no evidence of appendicitis or gall-bladder disease.

The Complications of Lobar Pneumonia have been taken up by Dr. Boggess in a most interesting way. I do not agree with him, however, when he says that in an empyema due to pneumococcus we should defer operation for a long time. I believe that Dr. Boggess has probably confused *Pneumococcus Empyema* with an *Empyema of streptococcus* origin.

Dr. Leavell handled the subject of "Treatment of Pneumonia" most excellently. The treatment

of pneumonia is probably more dependent upon the patient than it is on the doctor. For instance, in pneumonia of Type II pneumococcus there is twice the mortality than there is in pneumonia caused by Type I pneumococcus; therefore, you are just twice as unlucky if you happen to have a Type II instead of a Type I. As Cecil has shown in the above quoted paper, in Type II pneumonia even after use of Felton's concentrated serum, his average mortality was 40% during the years in which he has made his observations, against a mortality of 45% in those that were untreated. This is some advantage, but still it is somewhat like the two men who were talking about prohibition. The first fellow said, "This prohibition is awful." The second fellow said, "I know it is, but it is better than nothing."

I am greatly interested in the modern treatment of pneumonia by the serum method and hope that there will be as much improvement in this within the next ten years as there has been within the last ten

**Virgil E. Simpson:** The Chairman of your program committee asked me to do some "pinch hitting" in the absence of the scheduled discussant.

The essayists of the Symposium have, indeed, brought the literature on Pneumonia down to March 7, 1932, hence there remains only the task of briefly summarizing my conclusions, the result of a fairly close study of the literature as it has developed, the experience of a clinical contact covering two decades and an appreciative audition to the readings just presented.

First in importance from the viewpoint of both prognosis and therapy stands the bacteriological ensemble. Unique in the galaxy of transmissible diseases pneumonia presents a veritable Pandora's Box in its etiological study. No other clinical entity is caused by such a group of offenders, numerically. We were sufficiently impressed when the bacteriologists carefully separated the causative organisms in four groups and classified them in terms of types. We grew, with the lapse of years, a bit less uneasy in the presence of this etiological quadruped and indulged in hopeful therapeutic speculations. Then, rather hurriedly, the bacteriologists shake Type 4 in their laboratory dice box and out rolls more than twenty separate, individual, distinct, properly placarded organisms. Ere long one may anticipate a centipede usurping the stall of the quadruped.

This leads to the second conclusion. Weichselbaum nearly a half a century ago emphasized the fact that inflammation of the lungs could be caused by many kinds of germs. That statement remains true, but since then it has been found that the pneumococcus causes the larger number of cases characterized by lobar consolidation. The logical outcome of a recognition of these clinical and laboratory facts was the effort to limit the conception of lobar pneumonia to the

group caused by the pneumococcus. The pulmonary inflammations resulting from the other organisms should, properly, not be designated as pneumonia. As yet there has been no satisfactory concurrence in nomenclature.

Thirdly, the facts just alluded to make typing a matter of clinical expedience. Type IV causes about 20 per cent of all pneumonias and as this group comprises heterogenous strains with little immologic properties in common even the hope of a practical specific therapy is well nigh futile. Further, since some 60 per cent of all lobar pneumonias are due to Types I and II and as Type II presents many atypical strains, it must follow that specific therapy for Type II cannot be as successful as for Type I, notwithstanding the identity of Type II by agglutination, morphologic and cultural characteristics. Attention is also called to the fact that a reasonably high liter of serum in the immunization of horses has been obtained only with Type I and at a recent meeting of the Revision Committee of the United States Pharmacopoeia we decided to admit only Type I serum as official. But it has not yet been determined if the pneumococcus infection can be attributed to a true toxin, to an endotoxin or to split bacterial protein products, and while pneumococci, autolysates are both toxic and hemolytic, neutralization of these properties is not completely accomplished by specific sera. The explanation of the crisis in pneumonia must be more satisfactory than that offered now before all the issues of specific therapy are at rest. The crisis is not the result of pathologic changes in the lung, nor can it be explained by a rapid loss of virulency of the organism. Since the phagocytic activity of a serum seems to determine its protective action, one wonders if phagocytosis be the basis of both recovery and of immunity.

Fourthly, I have been much interested in the relationship between the mortality and the bacteremia. As long as the pneumonia remains a lung pathology the mortality rarely exceeds 10 per cent. When blood cultures are positive the death rate climbs to 50 and even 60 per cent. The greater the number of colonies developing on the culture the graver the outlook. Putting it more vividly, one might state that as long as the disease remains a local condition the outlook is good, but when it becomes a bacteremia the prognosis is grave.

And, finally, I have been intrigued by the study of the relationship of the mortality to cyanosis and hence, indirectly, to oxygen therapy. While there is some parallelism between the cyanosis and the extent of consolidation yet the loss of aerating space is practically compensated by alveolar dilatation and increased respiratory rate. Deficient aeration is not the explanation of cyanosis. There is, however, a diminished oxygen-combining power of the blood. This can be demonstrated in animals, experimentally infected with pneumococci with no pulmonary lesions.

This loss of blood-combining power is due to the change of hemoglobin into methemoglobin and is the direct effect of the pneumococcus. On such conception of the cause of cyanosis the use of oxygen becomes intelligible and a considerable of methods and apparatus understandable and desirable.

**Siegel C. Frankel:** The discussion this evening with reference to the therapy of Lobar Pneumonia reminds me of some twenty years ago when the Jefferson County Medical Society met at the Galt House when the treatment for Lobar Pneumonia came up for discussion. There were always two distinct sides to the discussion; one recommended big doses of digitalis and the other no digitalis but tincture of Aconite Root; each agreeing and meeting on the middle ground that plenty of whiskey was absolutely necessary in all cases.

The recommendation for treatment this evening has, as has been stated, been brought up to the latest method of treatment. This being the case, I wish to speak somewhat along other lines of treatment than the oxygen tent, serum therapy and the latest therapy which has been discussed.

In lecturing to the medical students I lay more stress upon the blood pressure readings than I do on the temperature curve, pulse rate or respiratory rate. We expect the systolic blood pressure to fall about 20 mm. of mercury the first few days but if possible it should not be allowed to fall below that. Whenever the systolic blood pressure reading in millimeters falls below the pulse rate reading per minute, it is a sign of cardio vascular asthenia and, to my mind, calls for strenuous cardiac stimulation. For this purpose I rely considerably upon caffeine-sodium benzoate, digitalis, pituitrin, strychnine and in sudden emergencies adrenalin. If the patient is very toxic and takes very little nourishment, 50 per cent glucose intravenously administered every two or three hours for several days sometimes helps to sustain the patient and relieve the toxic state.

**J. Murray Kinsman (in closing):** There is only one more thing I wish to add, and that concerns the method of typing in those patients who cannot raise sputum. In such cases a swab from the posterior pharyngeal wall may be inoculated in broth medium which is then incubated for two or three hours. Then one or two cc. of this broth culture may be injected into the peritoneal cavity of a white mouse, and the typing then carried out in the usual way. In a certain proportion of cases this will yield accurate results.

**Hugh R. Leavell (in closing):** The most important thing is to lay emphasis on the use of serum early. If it is going to be administered at all, it must be given within the first three days and with the various methods of rapid typing there is no reason why a diagnosis cannot be quickly made and serum given without delay.



The expense of serum, which is considerable at the present time, is an important consideration, as it amounts to about \$100.00 for treating the average case. A large part of this expense is due to the cost of standardization by measuring protecting power of the serum against virulent pneumococci in large series of mice. Felton recently showed that the serum may be just as satisfactorily standardized by measuring agglutinins and other antibodies in the serum, with much less expense.

In regard to the use of morphine, it seems quite evident that certain cases will require some sort of opiate in addition to diathermy to control pleuritic pain and relieve apprehension. In using morphine, its action on the cough reflex may sometimes make it difficult for patients to raise sputum satisfactorily, and this must be considered. Dr. Osler is reported to have been very grateful for the morphine used when he had pneumonia. Another unfortunate effect of morphine is that of increasing distention. In the majority of cases, codeine works as well as morphine, and is usually to be preferred.

**A. Clayton McCarty** (in closing): There are two things upon which I should like to lay emphasis. The first is the attitude of physicians in general toward pneumonia and the second is an effort to make the patient himself "pneumonia conscious."

There is a certain fatalistic attitude among members of the profession toward lobar pneumonia. This has been evidenced even in conversation with some of the speakers on tonight's program; and yet their papers have shown how little justification there is for such an attitude. Too often newer methods of diagnoses and treatment in pneumonia are not made use of because the percentage of good results with these newer methods is very little greater than those obtained with older methods. When one considers the great prevalence of pneumonia, an improvement of even one percent in mortality and morbidity means many thousands of cases improved or saved. As physicians, let us therefore, make use of the latest and the best in this serious condition.

As to the laity, a more intensive campaign of education should be carried out. People generally are frightened enough when pneumonia has actually set in but they are not sufficiently apprehensive about the coughs, colds and general debility which precede the pneumonia. Much is said about the early diagnoses and treatment of cancer, tuberculosis, heart disease, etc., but not enough concerning rest and adequate care of deep colds. A drug store nostrum is usually resorted to and the doctor many times does not see the case in that all-important stage—the first three days. Several years ago it was my pleasure to hear another symposium on the same subject in the East. Drs. Solis-Cohen and Robertson

spoke on the general treatment; Drs. Cecil and Hutton on the use of sera and anti bodies; Dr. Snow on diathermy, and the late Dr. Joseph Sailor on the intra-venous use of mecurochrome. Each reported uniformly good results in cases when treatment was begun during the first three days of the disease; very poor results in cases where treatment was begun after the third day.

Type III pneumonia is still the "boogie-boo," but even here encouragement is to be noted. Avery of New York is to report his very fine work on the enzyme which dissolves the polysaccharide capsule of the Type III pneumococcus at the College of Physicians in San Francisco next month. And so the future is hopeful. Better tools are being placed in our hands all the time. Let us make the fullest use of them.

### THE DEVELOPMENT OF GOOD CITIZENSHIP.

BY J. GARLAND SHERRILL, M. D.

Louisville.

My remarks are addressed to all the people, but more especially to fathers and mothers, Parent-Teachers Associations, and all allied health agencies.

Everyone will admit that the greatest influence in the development of a child is a sound body, and the next most important factor in this development is a sound mind.

Certain diseases and certain mental and bodily traits are transmitted from parents to their offspring. Such diseases and many of the mental obliquities are well known. Every person who contemplates matrimony should be fully informed of such taint in his make-up, and should decide whether he desires to marry and risk bringing defective children into existence.

To effectually prevent the propagation of defectiveness, such persons should not marry. The rule should be, "Stop before you start." Do not wait until after marriage and hope by methods of contraception and birth control to prevent the birth of defective children. These methods, in my opinion, are detrimental. The best advice to young people contemplating matrimony is to be sure you are both well; also to be fairly sure that you can support a family. This responsibility should weigh more heavily than it does. Bad environment, poverty and crime go hand in hand. Why risk handicapping your offspring at the start?

At present, many people feel that the government should assume parental duties and relieve the parent of the care of the children to a great degree. This view is in part the result of change in our manner of life. The parental influence is much less

than formerly, and its place is taken by the Teacher, the Parent-Teachers Association, the school physician, the school nurse and other social workers.

The result of such supervision is that the child loses his contact with his parent, becomes the ward of the state, and instead of making a self-reliant citizen, gradually drifts into the charity group.

It is handier for many mothers to give a dime or two to the child and let him buy his lunch at school. It is easier still for others to let the child be fed at school on charity. All this leads to everyone, in part at least, depending for support upon the government. In other words, we are drifting from an independent people who believe in our government, support its institutions, uphold its integrity, and fight its battles, into a nation of parasites.

Paternalism is rampant, and the belief is prevalent that happiness, business success and prosperity can be distributed to the people from the central government by legislation.

We have gone so far that we vote millions of dollars for farm relief, millions for relief of the unemployed, and immediately vote a tax affecting every person in the country to pay the bill. No country can last based upon such an idea of economics.

Back to first principles. Home government should be reestablished, and the child should be brought up as an individual. He should learn the duties of good citizenship, right living, obedience to law, respect for his financial obligations, temperance and morality. He should be taught to avoid hypocrisy and cant, and should be made to see the evil in pretense. In other words, he should learn not to vote dry because he is afraid, and to be wet in practice on the sly. So many of our legislators in Washington are dry in theory and wet in practice.

This country needs to go back to first principles. The original constitution, as a document of the rights of man, is far superior to the one now adopted. Centralization and bureaucracy must be overthrown; the police power should rest with the state; respect for law and order must be held inviolable; a government office must once more be a sacred trust; graft and favoritism must be destroyed; legislation which takes from one man's pocket and places in another must be stopped; religious and personal liberty without license should be restored. Have we no great leaders who will head such a campaign? Economy in government of nation, state, county and town is essential to a restoration of our national and personal self-respect. Who dares to stand upon such a platform? When such a man is found, we

will be once more ready to go forward as the greatest country in the world.

### BOOK REVIEWS

**PRACTICAL TREATMENT OF SKIN DISEASES, WITH SPECIAL REFERENCE TO TECHNIQUE. A PRACTICAL MANUAL FOR PRACTITIONERS AND STUDENTS.**—By Eduard Ahlswede, M. D., New York and Hamburg. Formerly Assistant Physician, University Skin Department, Direction of Prof. Unna, Eppendorf Hospital, Hamburg; Asst. Physician, Clinic and Research Laboratory, Direction of Prof. Unna, Hamburg; Assistant Physician, Institute of Physical Therapy, Direction of O. Ahlswede, M. D., Hamburg. Forewords by Howard Fox, M. D., New York, and Prof. Dr. P. G. Unna, Hamburg. Svo. cloth, 798 pages, 77 illustrations. \$12.00 net. Paul B. Hoeber, Inc., Publishers, 73 Fifth Avenue, New York, N. Y. Publishers of *The American Journal of Surgery*; *Annals of Medical History*; *Annals of Roentgenology*; *Clio Medica*, etc.

There is undoubtedly an urgent need for a book in English on the practical treatment of skin disease. Ahlswede's work is a thoroughly practical manual which will be of great help to the busy practitioner, since it stresses primarily the ambulatory treatment of skin cases as they occur in every day practice.

The presentation is strikingly clear and accurate. The author tells with concise clarity just what to do and how to do it. The technique of treatment in particular is explained in minute detail so that it is easy to follow, even for the inexperienced.

While many methods of treatment, prescriptions, etc., are naturally of Central European origin, the author is very critical of his own school and has not written the text with any idea that the methods presented are the only ways in which various skin diseases can be treated. A large number of English, American and French authorities have been quoted.

There is a minimum of theoretical considerations, the textbook character having avoided altogether, while innumerable "tips" are given to help treat the numerous skin diseases effectively and with a minimum of equipment and expense. The latter point is stressed as being of great importance since the general practitioner is not always equipped with an X-ray machine, Kromayer lamp, etc.

There are no mechanical compilations of prescriptions or methods of treatment. Throughout the book the author emphasizes the importance of etiological treatment, and relies on purely symptomatic measures only in dermatoses of entirely obscure origin.



# Kentucky Medical Journal

Published Monthly By

THE KENTUCKY MEDICAL ASSOCIATION  
Incorporated

Entered as second class matter October 22, 1906, at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

Subscription Price .....\$5.00  
Edited Under Supervision of the Council

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NEXT MEETING LOUISVILLE

OCTOBER 3, 4, 5, 6, 1932

## COUNTY SOCIETY REPORTS

**Grant:** The Grant County Medical Society met Wednesday, August 17, 1932 at the office of the Health Department at 7:30 p. m.

The following members were present: Drs. N. H. Ellis, A. D. Blaine, J. W. Abernathy, H. F. Mann, W. J. Zinn, C. M. Eckler and C. A. Eckler.

The minutes of the last meeting were read and approved.

As there were no committees to report and no correspondence to report, we now took up case reports in our every day practice.

Dr. A. D. Blaine reported a case of a woman with acute abdominal pain who stopped at his office in transit on the Dixie Highway. She was so seriously sick from pain the doctor had to give her a hypodermic.

She was later moved to the county infirmary as she had no place else to go.

Dr. N. H. Ellis at this time exhibited a new treatment for syphilis for intramuscular use where neo-salvarsan did not change the Wassermann.

At this time there was a motion and second that Miss Mary Franklin O'Hara be made an honorary member of this society. Motion was carried and we were very glad indeed to welcome Miss O'Hara, Grant County Public Health Nurse and we assure her our hearty support and cooperation in her new field of work.

Talks about the scarcity of typhoid fever in our midst was discussed at length and it was very easy to account for it. The advances made in hygienic measures as carried out by our worthy health officer, has gone a great way in illuminating this dreaded disease.

They decided that typhoid vaccine was responsible almost 100 percent as a measure in illuminating this disease.

The subject for the evening, "Diarrheas," was opened for discussion by Dr. Harry F. Mann of Crittenden. Dr. Mann made a most excellent talk, clear, learned and forceful and to the point. He showed clearly that he was master of the subject. He talked at length on preventative measures, showing the decrease of the disease in improved sanitation.

As to the treatment of children especially he would use the colon tube, paregoric alkalized his patient use subcarbonate of bismuth, and Paset's remedy. He also would use calomel and plenty of fresh air, absolute cleanliness and plenty of sterile water.

Dr. A. D. Blaine reported the scarcity of cases of this nature stating that when he first began practice there were numbers of this disease. He reported a case of diarrhea in a man 83 years of age with a temperature of 102 and a pulse of 85. The diarrhea was uncontrolled.

Dr. Zinn talked on preventative measures in oral hygiene.

Dr. N. H. Ellis says in the country he advises all mothers to nurse their babies where possible and where they are bottle fed and use cows milk to boil the milk used for babies up to 2 years..

Dr. C. A. Eckler resorts to irrigation with normal saline in infantile diarrheas. He uses occasional doses of phenacetin for fever and nervousness early in the disease but resorts to hydrotherapy to control the fever. He stressed the importance of carefully feeding these cases.

Dr. C. M. Eckler and J. W. Abernathy also discussed these diarrheas and while just a few of our members were present each one expressed a belief that he was benefited by having attended the meeting. Subject for next time: "Fractures and Treatments of the Arm."

Discussion to be opened by Dr. C. D. O'Hara of Williamstown.

We now adjourned to meet the third Wednesday in September.

C. A. ECKLER, Secretary.

**Harlan:** The members of the Harlan County Medical Society held their regular monthly meeting in the basement of the Christian Church. After a splendid repast by the ladies of the church, Dr. Bailey, Secretary of the Society, in the absence of the president and vice-president, called the meeting to order at 1 p. m.

After a few matters of business had been disposed of Dr. Bailey introduced two well-known persons from the State Board of Health at Louisville, Mr. S. Clark Dugan, Director of the Bureau of Sanitary Engineering, and Mrs. Sarah Vance Dugan, Director of the Bureau of Foods, Drugs and Hotels. Mr. Dugan spoke first and gave some excellent points on General Sanitation. He mentioned four essentials which should be controlled in every community, viz: Water Supply, Sewage Disposal, Milk Supply and Nuisances. As Mrs. Dugan was to speak on Milk Supply, he omitted that subject.

Mrs. Sarah Vance Dugan then gave a brief summary of the methods of producing clean milk as practiced in Louisville dairies today, illustrated by a motion picture which she herself supervised. It was most practical and illuminating in view of the fact that the Sanitary Inspector from the State Board of Health, has recently been in our midst and made a survey of the local dairies which he reported at the Kiwanis Club and the dairymen of the community have organized a Dairymen's League, the future for an enviable milk supply in Harlan County seems unusually bright. It is the intention of the "Save the Children's Fund of America" whose representative has been in our midst for two months, to engage a sanitary inspector who will bend every effort to aid the dairies to

bring up the quality of their milk to the standards set by the State Board of Health.

A vote of thanks was extended to Mr. and Mrs. Dugan for bringing this message to us. The following was unanimously approved and ordered published:

It has been called to the attention of the members of the Harlan County Medical Society that there is an unusual number of cases of typhoid fever in the county this year. In order to combat this health menace and prevent an epidemic, the co-operation of every person in this community is required. There are three fundamental conditions which should be met:

#### General Home Hygiene

1. Every precaution should be taken to insure food and drink free from infection. Food should be thoroughly cooked and eaten hot or cooled quickly, before being eaten. Drinking water known to be polluted or to "have a germ" in it should be boiled twenty minutes. All fly-breeding places should be removed as far as possible or such as garbage and manure should be buried one foot under the ground. Flies should be "swatted" and no food contaminated by flies should be eaten. Any person in the home who has had typhoid previously may be a typhoid "carrier," and should be examined by his physician lest he infect other members of the family.

2. It is a well known fact that all Kentucky rivers are polluted and should not be used for swimming purposes. Polluted water taken into the mouth may cause not only typhoid fever but set up a sinus infection which may have fatal results. A Harlan city ordinance prohibits swimming in the river around the city and holds parents responsible for minor children indulging in this dangerous past-time.

3. Inoculation against typhoid or "shots" as they are commonly called, should be taken by every person who has not been so treated during the past two years. Do not delay in this matter for delay is dangerous, but consult your family doctor at once. For those who are unable to pay, special arrangements will be made.

Those concurring in this warning to the public include:

Dr. E. M. Howard, President of the State Board of Health.

Dr. A. T. McCormack, State Health Officer for Kentucky.

Dr. W. P. Cawood, Health Officer, Harlan County.

Committee appointed by the Harlan County Medical Society at their regular monthly meeting, June 23, 1932.

(Signed)

H. K. BUTTERMORE, M. D., Chairman.

W. M. Martin, M. D.

IVA M. MILLER, F. D.

CLARK BAILEY, M. D.,

Secretary



# KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. 30 No. 11

BOWLING GREEN, KY.,

NOVEMBER, 1932

## THE LOUISVILLE SESSION

The Kentucky State Medical Association passed its Eighty-second mile-stone at its Louisville Session, and what a golden mile-stone it was-

Of course, every physician in Kentucky was interested in the meeting and many of those who attended it made real sacrifices to do so. They all felt that this was the time to demonstrate to the people of Kentucky the determination of the medical profession to carry on, and they proved their faith by the registered presence in Louisville of more than one out of every three active practitioners in the State. From many counties every man in active practice was present. The attendance at the Scientific Sessions was unprecedented and most of those in attendance remained throughout each session. Of course, many drove in for a day, but more hotel rooms were occupied throughout the session by members than at any previous meeting.

While the spirit of the profession was the dominant factor in this successful session, too much honor cannot be paid to the splendid preliminary work done by President Barbour. During the year he has been present at county and district society meetings in every section of the State and his splendid spirit of optimism dominated the meeting.

Every paper was presented on schedule time. The discussions were timely and interesting. The Scientific Program, which had been so carefully prepared by Doctor Orville R. Miller, covered practically every recent advance in scientific medicine.

The proceedings of the House of Delegates will interest every reader of the JOURNAL and indicate the deep interest which the profession has taken in its responsibilities to the people of Kentucky. Especially noteworthy were the report of Doctor Virgil E. Simpson, on the last session of the House of Delegates of the American Medical Association at New Orleans, and the excellent report on health problems in education by Doctor Oscar O. Miller.

Doctor W. M. Martin, of Harlan, was unanimously elected President. Doctor Martin's election was a tribute to his many years of unselfish service to the profession. No other member of the profession has given more of his time and energy to organized medicine. Doctor Martin is the first Presi-

dent to be elected from Southeastern Kentucky and he expressed the feeling that he was honored at being a representative of the splendid professional organization in the Eleventh District, of which he has been Councilor for many years.

The next Annual Session will be held at Murray in September, 1933. Preparations for this Session are already under way and this easily accessible and beautiful Western Kentucky city will be the objective towards which professional activities for 1933 will be aimed.

## WASSERMANN AT THE STATE LABORATORY

All Wassermans and Kahn tests for syphilis are made at the Public Service Laboratories of the University of Kentucky, at Lexington. Careful examination of its records shows that most of these are from the State institutions and part-pay clinics conducted by the several county medical societies, but an increasing number are coming from the physicians of the State.

The State Board of Health requests us to call to the attention of the profession the importance of sending Wassermann specimens to the several splendid private laboratories of the State for patients who are able to pay for them. It is manifestly unfair to the splendid members of the profession who have qualified themselves to conduct clinical laboratories that they shall not receive the support essential to their successful operation from the physicians of the State able to pay for them. Of course, this is a matter that can only be handled by the individual physician. He is the only person in a position to know the ability of his patient to bear this expense.

The State Board of Health feels that its venereal disease program is one of the most important and far-reaching public health procedures. Not only during the initial and infectious states of venereal diseases, but throughout the course of treatment, and in cases of syphilis, for several years afterwards repeated blood tests are indicated. The Board is particularly anxious that no individual shall be deprived of the safeguards which these tests throw around his treatment or that they shall be left undone because he hasn't the means to pay their expense. Many of our physicians have tests made at the Laboratory because they cost nothing, in

order to keep their records accurate. These tests are not made because of their importance to the patient, but purely as matters of scientific study and satisfaction to the physician. Of course, that is one of the purposes of a State Laboratory.

Another use of the State Laboratory has been brought to the attention of the State Board of Health which is so rare that we mention it only to express pride in the altruism and high purpose of the physicians of Kentucky. It has come to the notice of the Board that a few physicians have charged their patients for tests made at the Public Service Laboratory. Of course, this is a fraud upon the public that will, when proved, result in the revocation of the certificate to practice medicine of the offender.

This matter of a dividing line between service by the State and private laboratories is one that can be settled easily in each particular instance by the thoughtful physician. It cannot be settled accurately by anybody else.

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### THE SOUTHEASTERN SURGICAL CONGRESS

The Fourth Annual Assembly of the Southeastern Surgical Congress will be held in Atlanta, Georgia, March 6, 7, 8, 1933. The meeting was so well attended last year in Birmingham that the members requested a three day program which will now include clinics conducted by the speakers. The Executive Secretary, Dr. B. T. Beasley of Atlanta, is to be congratulated upon the success of this Congress, and every surgeon in the Southern States is cordially invited to attend. In the near future the JOURNAL will publish the program and list of speakers.

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### THE LEAGUE OF CHRISTIAN PHYSICIANS

The League of Christian Physicians of the Kentucky State Medical Association held their meeting at the Warren Memorial Church, Sunday, preceding the general session. Doctor Howard A. Kelly, Baltimore, the distinguished surgeon, naturalist, and writer, was the speaker. Many of the churches of Louisville united with the League. The large auditorium, which seats nearly 3,000 people, was filled and extra chairs had to be provided for the large crowd. There was not even standing room left in the auditorium. Many physicians and their families from all sections of the State came to this meeting and were fully repaid, for Doctor Kelly is a very brilliant speaker.

Next year the meeting will be held on the Sunday evening preceding the general session in Murray, Kentucky, and the League hopes to have an equally distinguished physician as guest speaker on that occasion. All physicians who are doing active work in their respective churches are considered members of this League.

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### HICKMAN COUNTY

Through one of those inexplicable errors that occur in every office, we find that the report for Hickman County was omitted in the Annual Report in the JOURNAL. We are rather glad of this omission because it gives us an opportunity to pay a special tribute to the loyal and effective organization which has been maintained in Hickman County for the past fifty years.

This is one of the smaller counties of Kentucky, but the character and attainments of the splendid physicians who have been there have placed it in the very forefront of medical influence. Two of the most distinguished men in the State, Doctors George Beeler and W. W. Richmond, were residents of Clinton. Both were for many years members of the State Board of Health and both were presidents of the State Medical Association.

Hickman County has one of the best full-time county health units in the State and its maintenance has been due to the loyal support of the physicians of the county.

It is a pleasure to have the opportunity of making this correction in justice to the splendid profession of this fine county.

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**Pulmonary Tuberculosis and Diabetes Mellitus.**—Moller reports the case of a patient, aged 52, with slight adiposity, diabetes mellitus, fibrocavernous tuberculosis of the right lung, tuberculous laryngitis, slight arterial hypertension, arteriosclerosis and slight myocardiac degeneration, the most important diagnosis being the tuberculosis and the next in importance the diabetes. He calls attention to the unfavorable effect of diabetes on pulmonary tuberculosis and to the particularly insidious onset of the tuberculosis in cases with diabetes; occasional stethoscopic examination of patients with diabetes is recommended. The origin of the tuberculous infection in this case is unknown, but a familial disposition is probable and the diabetes is thought to have played a part. A familial disposition to diabetes is also likely. In treatment of the tuberculosis, strict observance of the diabetic diet is urged, with general hygienic treatment.



## SCIENTIFIC EDITORIAL

## OXYGEN THERAPY IN THE TREATMENT OF PNEUMONIA

As we are now approaching the season when pneumonia is most prevalent, it is well to consider seriously the newer method of its treatment with Oxygen Therapy.

In pneumonia the infection lodges in the lung producing consolidation more or less extensive filling up the air sacks with a resulting toxemia. The lessened area of lung space leads to increased work on the part of the circulatory and respiratory systems in order to maintain the oxygen balance, and the increased effort fatigues the heart and respiratory centers, which are already being progressively weakened by the toxemia of the disease. At first the increased effort may compensate for the lung impairment, but soon there appears actual oxygen want which itself produces profound alteration in the chemical processes of the body. Thus a vicious circle is established which in a high percentage of cases leads to a fatal termination.

With Oxygen Therapy we have at hand a means of relieving at once this important group of serious symptoms known as oxygen want or anoxemia. With this important factor in the fatality of the disease eliminated, our efforts may be directed entirely to the means at hand for combating the toxemia.

The beneficial effect of Oxygen Therapy in the treatment of pneumonia is most apparent to those who have observed it. There is almost an immediate decided lessening of respiratory rate, a slowing of the pulse, a clearing up of cyanosis, a relieving of the distress of the patient, and in many cases a lowering of the temperature. Some cases, if given the treatment early during the congestive stage will abort and will not go on to consolidation. I saw a patient of this type just two weeks ago. Not only clinically can the beneficial effect be so clearly demonstrated, but a study of the arterial blood will show a return to the normal level of the blood saturation with oxygen.

Oxygen treatment should be begun early as soon as the diagnosis is made or pneumonia is suspected, before too much damage is done and should be continued until the disease is terminated. It would be useless to give diphtheria antitoxin after the patient becomes moribund or insulin for diabetic coma after the central nervous system has been so severely damaged by the acidosis that it is beyond the state of repair. In pneumonia we are fighting a disease that destroys life very quickly, and each day of delay brings on less chance of recovery.

Those who have had experience with Oxygen Therapy in pneumonia would no more think of treating this disease without it than they would think of treating diabetic coma without insulin or of permitting a severe case of appendicitis to die without an operation.

An argument may be used that Oxygen Therapy is not available or that it is too expensive. It is now available both in homes and in hospitals to every physician, and it is not too expensive. The average cost of treating a pneumonia case with Oxygen Therapy is not as much as the cost of an operation and if one's life is at stake there can always be arranged the means of having an operation. The same is true of Oxygen Therapy, and there is certainly no disease today that is more serious and which takes a larger toll in mortality in all ages, than pneumonia. As physicians familiarize themselves with this treatment, their use of it will increase in direct ratio.

R. HAYES DAVIS.

## PRESIDENT'S ADDRESS

## WHY A DOCTOR\*

PHILIP F. BARBOUR

Louisville.

The Universe about us is an unsolved mystery which challenges our intelligence to find an explanation. The scientist solves one little problem only to find that the mystery is greater and more profound.

The active human mind is always seeking answers to questions. The little baby soon begins to investigate hands and feet. The older boy runs us wild with question upon question. The young generation wonders if there is not some new answer to life's queries. It is the hallmark of senility when things as they are, are accepted as final and there is no further interest only an unquestioning acceptance of a settled fate.

But life is to mean something to us and how shall we get the most out of it? Our young people and the modern psychologist are stressing self expression. That self expression is often a poor thing; shallow, selfish, vacillating, inconsequential. We should think more profoundly of the things which affect that self within us, which offer possibilities of greater self development.

We have intellect, emotions, altruism. How shall they be developed? All life, business or professional, offers opportunity for self development but the results attained will be conditioned by the choice which has been made.

We have chosen for ourselves medicine as

\*Delivered before the Kentucky State Medical Association, Louisville, October 3, 4, 5, 6, 1932.

our profession. In the case of most of us, our choice was dictated by various considerations but now that we are in it we must often think seriously about what our profession means to us. What does the practice of medicine do for the ego, the self within us, that other professions or callings cannot or do not effect? What changes does it bring in our personalities, what possibilities does it offer for the development of all those qualities which go to make the ideal man?

All professions call a man out from general mankind and set him apart. Whether he be lawyer, preacher, doctor or teacher his is to be a life of service and with few exceptions he will give more than he receives. His preparation must be long and arduous varying with the character of the life work. But the student of medicine must stay in school longer and undergo a harder preparation than any other of the professional aspirants. Aside from the monetary rewards we should say that there is a certain compensation in the intellectual discipline that accrues from all study, in the well rounded development of the emotions from intimate human contacts, and from the expression of altruism for which so many opportunities arise. But there are essential differences in the methods and results of the different professions.

The lawyer deals with the eternal laws of righteousness and justice. Such laws are fundamental to human nature and are as far reaching as the human race. The daily contemplation of these abstract principles should develop a noble spirit and a high character. However low the pettifogging lawyer may descend and however base the unscrupulous lawyer may prove to be, yet the great lawyers and judges illustrate to what heights this type of man may attain. The consideration of the profound problems of law and government is a great discipline to the intellectual abilities and as a nation we are indebted to the great jurists of the past for much that has been crystalized into our civic life. One limiting factor is the close adherence to precedent and tradition which has often shackled court action and perverted justice. Even lawyers acknowledge the narrowing effect of this tendency but the modern judge is becoming subservient less to the letter of the law and more to the underlying principle.

However, law has not the interest in the person that theology and medicine possess so greatly. The lawyer may protect his client from worry, loss of finances or of life itself yet it lacks that man to man intimacy that enriches both lives.

There is unquestioned breadth of vision that comes from contacts with many minds. The understanding of human nature and the emotions and passions which sway it brings

mental discipline but it lacks the exactness which is contributed by science. The facts of science may be used by law but the methods are mostly foreign to the legal mind.

The minister has supreme advantage in that the subject of his intellectual life is the Lord God Jehovah, the greatest, all embracing thought that is possible to the human mind. The relation of man to his Maker is of supreme importance and those great souls who have helped to solve this problem have influenced the spirit and destiny of the human race to a remarkable degree. Buddha and Mohammed must bow only to Moses and Paul in their influence on world history and philosophy would be poorer intellectually had there been no Luther or Calvin.

The altruistic life of the self sacrificing minister is no mean contribution to the progress of the race. The trend of his thought and the active sympathy with human nature make the minister's life full and rich. The alleviation of mental ills is more difficult and more valuable perhaps than the relief of physical ills and the up-to-date alienist will work hand in hand with the minister in the field of mental therapeutics. It sounds captious to say that the intellectual life of the minister would be more wholesome if science could be utilized more frequently as a control to prevent loose methods and results of his thinking. It would prove a distinct advance if religious experience and belief could be tested out by scientific analysis, just as physical or intellectual well being may be measured. We need more refined methods of assay to evaluate correctly human beliefs. A Binet-Simon test applicable to religion would clear out a lot of dead timber from many a church. It is the lack of such precision that allows the hypocrite and the charlatan to prey upon society.

Many have thought science anti-religious as if truth could ever be antagonistic to itself but there is a quite noticeable trend in scientific thought today towards a better understanding between science and religion and it is gratifying that a number of the pre-eminent scientists of today are feeling out after religion which they have heretofore rather looked down upon as unworthy of scientific investigation. In this new rapprochement the physician as a scientist and a humanist takes the deepest interest. In this connection it may be noted that more than a fourth of the scientists listed in Who's Who are members of the Church. A large proportion of doctors are fundamentally religious. Their training and their contacts with many peoples and many creeds save them from a narrow bigotry which some poor souls call religion.

The life of the teacher is one of the noblest



in that it is self sacrificing and idealistic. The intellectual exercise of reading, studying, learning and imparting knowledge brings culture and issues in a satisfying inner life. Of course the teaching of immature minds lacks something of the mental stimulus that pertains to teaching in graduate schools; but there is unquestioned advantage in the contact with active even if young minds. When Hippocrates laid upon his followers the duty and necessity of transmitting medical knowledge to their students he probably did not realize how such instruction required mental preparation which was possibly more valuable to the instructor than to the instructee. The altruism which enables them to labor on and on in developing character and knowledge in their pupils reacts upon their own character and enriches it. The years devoted to study and preparation help to discipline the mental faculties of the physician. The variety of subjects which must be mastered broadens one's interests and stimulates the thinking.

The intellectual life of the physician is also favored by the fact that there is a foundation of exact scientific knowledge which underlies most of his thinking. However far the intellect and imagination may venture mental discipline accrues from having solid scientific facts from which to spring and to which return must be made. This does not mean that all physicians know all that science has revealed about the physical make up of the human body. No human brain could learn or retain all the minute proven facts of medical knowledge. The sciences which deal with only the physical aspects of life are so voluminous that the chemist does not pretend to know more than a portion of chemistry. The biologist does not claim complete knowledge of all forms of life. The biochemists and the physiologists are still far from accord on many of the elementary points in their fields. This very lack and inadequacy of knowledge furnishes the stimulus for more thorough and deeper investigations such as have always challenged those of a scientific bent of mind.

This era is called the scientific age because in so many fields of human endeavor there have been so many discoveries of the kind to add to human comfort and efficiency. Many of these have helped the physician in his knowledge of body processes and in his recognition of abnormal conditions the result of disease. The x-ray for instance enables us to corroborate by sight the other senses of hearing and feeling. The marvelous advances in surgical methods, the increasing knowledge of germs and their effects upon the body, the progress in the knowledge of the chemical living processes in the body, the wonderful developments in the application of

new and pure drugs have revolutionized medicine and added to the health, longevity and happiness of the race. Scientific exact checks to loose thinking make for clearer intellectual processes. The necessity of making the theory fit known facts has had a very salutary effect upon the mental processes.

We should be careful to guard against fettering our intellects. Mental discipline issues in mental growth and develops intellectual ability. But the imagination is also an intellectual attribute and many of the most valuable additions to medical knowledge have come by those flashes of intelligence which for want of a better name we may call intuition rather than by the labored method of experiment and research. But such flights of the imagination need to be checked and when they were guarded by rigid experiment have resulted in marvelous discoveries. Imagination and cold reasoning are mutually helpful. Pegasus may not have made a good plow horse but he was nevertheless useful.

The imagination is being over worked these days. There has never been a time when so much pseudo-science is being dumped upon the public. The radio, the magazine and the Sunday supplement from mercenary or other motive send abroad a mass of untrue or half true misleading statements. Even our medical journals are full of undigested articles proclaiming something as new and up-to-date which six months further experience would have corrected. We are apt to be swept off our feet by these aspirants for fame or notice unless we use uncommon common sense.

The appeal of humanitarianism brings to the intellectual life of the doctor another opportunity for self expression. James the eminent psychologist has stressed the fact that an emotional appeal that does not issue in some sort of action will react to destroy emotional response. It is hardly possible for a true physician to lose the fine sense of sympathy with suffering humanity. Quite the contrary. The larger experience brings a more complete understanding. As Dr. John Brown says so truly in *Rab and His Friends*, "In them pity as an emotion, ending in itself or at best in tears and a long drawn breath, lessens, while pity as a motive is quickened and gains power and purpose. It is well for poor human nature that it is so." Undoubtedly the emotional appeal saps the strength of the attending physician. The physical labor of a large practice is a tremendous drain upon the vitality and is increased by the irregularity of life and the loss of food and rest. But anxiety over the outcome of a serious case, sympathy with patient and family in unavoidable sorrows, and sometimes the despair over poor, weak, ignorant and

evil human nature takes a huge toll out of the doctor's heart and strength.

This personal interest which the doctor has had in his patient has been one of the vital factors in the past history of our profession. We are now passing into the mass production period of large clinics which offer many advantages to the public as well as to the doctor. But there are also disadvantages which are quite patent. These changing times and customs call for a real leadership which is not yet in evidence.

Our knowledge of the various influences material or spiritual which control human nature lays a real claim upon the physician for leadership in many things which affect human kind. In a measure the doctor of the older generation wielded a greater influence but he was in a sense alone in his efforts, because he alone understood the conditions which were to be ameliorated. He had to work single handed. Now hosts of public health officers, trained social workers, and an enlightened people secure a cooperation that makes for results. The totality of things accomplished is by so much the greater because of the numbers who help. The physician now can be the leader in suggestions and find many helping hands to carry them out. The advance along all health lines has brought about a marked lengthening of life and prevention of many diseases which would have taken toll in strength or even life itself.

We have eradicated many diseases but noblesse oblige constrains us still to press on until children are born well and strong equipped with body and brain that will stand the strain of our complex civilization. We cannot rest upon our laurels but must still serve in all civic effort that our women and children shall have the chance to live and work in healthful and happy environment and that human life shall not be exploited.

Self expression when motivated by altruism is costly. The history of our profession is one long record of men who were willing to sacrifice even life itself that the truth as they saw it might carry on. The roll of the heroes of our profession is a long one though the world may not know them. Ross, Carroll, Laennec, Noguchi, have left us a heritage of altruistic self sacrificing lives than whom none are nobler, and yet the forgotten doctor who battles for his patient's life, in the lonely home, with no conveniences, with expert help, with necessarily limited equipment, is of the blood royal, though his fame does not extend beyond the boundaries of his own county. No one can fully understand this save him only who has travelled the dark road alone.

Our knowledge of diseases and of how they are spread requires us to enlist heartily in

all health work. Epidemics of all types lay special duties upon physicians as well as public health officers. All phases of child care and welfare work claim our enthusiastic support and aid. We must be leaders of thought in our respective communities along these lines. We should be constantly evolving new plans to combat illness and all the train of evils that flow from it.

The world faces many unsolved problems of depression, lack of employment, over and under production, but the solution of these is not our direct job. We have our problem in the physical well being of people and if we have also brought to the solution a strong intelligent mind controlled by high principle and filled with a genuine care for the world of troubled peoples around us, we shall have lived largely and "wrapping the drapery of our couch about us lie down to pleasant dreams."

### ORATION IN SURGERY THE EPILEPTIC PROBLEM\*

R. GLEN SPURLING, M. D.

Louisville.

The management of the epileptic patient is but one of the many trying problems with which practitioners of medicine are confronted. Probably no other condition, with the exception of cancer, has been considered to be more unsatisfactory as to treatment and more hopeless as to prognosis. Ordinarily not a death producing affliction, this scourge takes its toll by the anxiety and unhappiness inflicted upon the patient, his family and neighbors.

The convulsive state, which is the characteristic feature of epilepsy, is a symptom, not a disease entity, and should be considered as analogous to such a symptom as headache. In spite of the vast amount of research which has been accumulated over a period of many years, we are still totally unaware of the mechanism responsible for the onset of the fit. We do know, however, that there is a wide variety of pathological states which have as one of their manifestations convulsive seizures. Unfortunately, there is quite a large group of patients on whom we are unable to demonstrate the underlying cause. This latter group, fortunately becoming smaller each year, has been the one from which the term "idiopathic" epilepsy has sprung. In a recent article, Stanley Cobb (3) has listed in tabulated form the pathological states in which fits may occur and the probable mechanism involved in their production (Fig.1). From the study of this table, one is impressed

\*Delivered before the Kentucky State Medical Association, Louisville October 3, 4, 5, 6, 1932.



with the complexity of the problem. With increasing knowledge, it is hoped that the relative importance of the various factors now thought to be responsible for the epileptic seizures can be determined, so that those primarily responsible can be distinguished from others exerting only a secondary effect. Smith (10), from an analysis of 467 cases of epilepsy, classified his cases according to what seemed to be the most important etiological factor. His results are given in Figure 2. It will be seen from a study of this table that in about 30 per cent of the cases, the etiology was undetermined or obscure. This, I think, represents approximately the correct proportion of cases in which no definite underlying cause can be determined with our knowledge in its present state.

In considering the diagnosis of epilepsy, the age factor must be given an important consideration. Convulsive seizures, occurring in infants and young children, are perhaps

intestinal disorder or febrile disease must be considered to possess an unstable nervous system and is at least a potential epileptic. Idiopathic epilepsy usually makes its appearance before the twentieth year of life. Convulsions, occurring after the age of 25 years, are in the majority of instances due to some organic lesion of the brain. Notable among these are brain tumor, brain trauma and the various types of acute and chronic inflammatory lesions of the nervous system.

In arriving at a diagnosis, it is necessary to differentiate correctly between the various types of convulsive manifestations, i. e., grand mal, petit mal and Jacksonian convulsions. The grand mal seizure, as a rule, follows a definite pattern. This type of fit is so familiar to all of you that I shall not attempt to describe the sequence of events as they occur.

Petit mal epilepsy, however, does not, as a rule, conform to any one given pattern. This type of seizure may be overlooked by the unwary examiner, because he fails to attach sufficient significance to slight aberrations from normal behavior. Too often, petit mal attacks are diagnosed "gas attacks," "absent-minded attacks," "dizzy spells" or "peculiar behavior." Since most epileptics suffer from petit mal seizures months and years before the onset of the typical convulsion, it is important from the standpoint of treatment that the physician recognize these symptoms early in the course of the disease.

In petit mal attacks, the patient suddenly stops anything at which he is engaged. The features become fixed; the face pale; the pupils dilate, and often slight twitching of the facial muscles occurs. Consciousness is always momentarily lost. The attack may be so transient that the patient does not fall. After a few seconds, work or conversation is resumed at the point where it was left off. These petit mal attacks are usually not preceded by an aura. In rare instances, they may be accompanied by sudden forced movements. The patient may run a few steps, turn around, or make other automatic movements.

Jacksonian epilepsy is a form of the disease characterized by convulsive attacks, affecting only a single group of muscles, a limb or half of the body. The attack, for instance, may start in the toes of the left foot and progress slowly upward until the entire leg, the left side of the body and the left arm become involved in first a tonic and then a clonic spasm. It may stop at this point without loss of consciousness. On the other hand, it may proceed until the entire body is involved in a generalized epileptic seizure. Under such circumstances, consciousness is lost. Following the attack, there may be

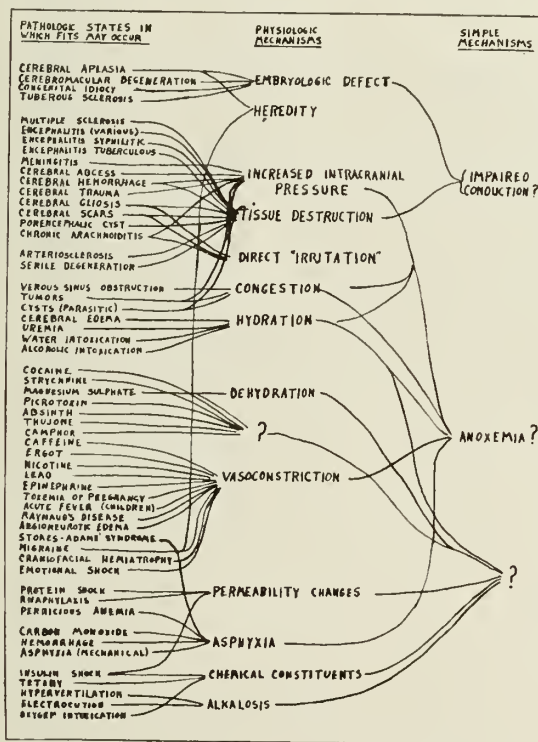


Fig. 1—Pathologic bodily states in which fits may occur. (Reproduced with the permission of Dr. Stanley Cobb, Boston, Mass.)

in the majority of instances non-epileptic, i. e. they may be secondary to febrile disorders associated with inflammatory lesions of the gastro-intestinal tract, genito-urinary tract, etc. We must not forget, however, that the epileptic child often gives a history of periodic convulsive seizures since early infancy. Certainly, the infant or young child who goes into a convulsive state with every gastro-

weakness or complete paralysis of the involved parts. This type of epilepsy is always due to a focal lesion affecting the cortical motor area of the brain. It may be due to a tumor, inflammatory lesion, injury or some degenerative change in the cells of the cortex.

In arriving at a diagnosis of epilepsy, the physician should remember that the stigmata of the disease must not be placed on the individual until all doubt has been removed. In distinguishing between the various types of convulsions and in determining their cause, an accurate history should be obtained, not only from the patient but from relatives or friends who have observed an attack. Better still, it is desirable that the physician himself should witness an attack.

Every patient suffering from convulsive seizures is entitled to a thorough medical study, including a complete neurological examination, laboratory examinations and encephalographic studies. It is only after all available data related to the underlying cause are obtained that intelligent treatment can be planned. Fortunately for the patient, the day has passed when the practitioner can conscientiously dismiss a patient suffering from epilepsy, discouraged by a hopeless prognosis and poorly solaced with a prescription for luminal or bromides.

With the introduction by Dandy (4) in 1919 of pneu-encephalography, the study of organic brain lesions received a tremendous impetus. This important diagnostic measure has practically revolutionized the localization of obscure brain conditions and has opened up, because of the additional information obtained, new avenues of treatment heretofore unknown. The introduction of air directly into the ventricular system through a trephined opening in the skull is known as ventriculography. The replacement of cerebrospinal fluid with air through the lumbar subarachnoid space is called encephalography. This latter procedure has become the standard method of visualization of the interior of the brain and subarachnoid space in cases of epilepsy where there is no marked increase of intracranial pressure. By replacing the entire volume of cerebrospinal fluid with air, it is possible by means of carefully taken x-ray films to study not only the interior of the brain by visualization of the ventricular system, but the exterior of the brain as well. This important procedure stands in the same relative importance to neurological diagnosis as does the pyelogram to urology and the cholecystogram to abdominal surgery. When the procedure is properly performed, an accurate diagnosis as to the location and nature of the lesion may be arrived at with great uniformity. Curiously enough, the

injection of air in the subarachnoid space in some way has a beneficial effect upon the number and severity of convulsive attacks. Patients have been known to be free of convulsive manifestations for many months following this procedure when no other therapy has been employed. It is not because of the possible therapeutic benefit that we advise encephalographic studies in every epileptic patient, but because the information obtained provides us with data which may be indispensable for the proper management of the case. The procedure is not wholly without danger. In our series of over 200 encephalograms, there has been one death, and that occurred in a patient in whom, from the standpoint of our present knowledge, air studies were ill-advised. There are two certain contraindications for employment of encephalography: First, and most important, is the presence of a highly increased intracranial pressure; second, an active inflammatory lesion of the meninges.

Plain x-ray plates of the skull should always be made before resorting to the air studies. Not infrequently, one finds unmistakable evidence of a brain tumor from study of the plain films alone. In such instances, air studies become necessary.

#### SURGICAL TREATMENT

The surgical treatment of epilepsy is limited to those cases which have been shown by careful preoperative study to be due to circumscribed lesions of the brain. Such lesions are most commonly secondary to either traumatic brain injuries or brain tumors. Foerster and Penfield (6) have demonstrated that following a traumatic injury to the brain, a scar is formed consisting of connective tissue and proliferative glial tissue. Such a scar may become attached to the meninges, depressed fragments of bone, or if there is a bony defect, it may be attached to the scalp itself. Under such circumstances, traction is made upon the motor cortex by the contracting scar tissue and epilepsy results. The average interval between the injury and the onset of convulsions is about five years. Convulsions secondary to lesions of this type may be either of the Jacksonian or grand mal variety. In treating this type of case, it is necessary to excise completely the glial scar before much improvement can be expected. It is our practice to excise the scar widely, continuing the dissection until the ventricle is opened. When the scar involves the motor cortex, the paralysis is temporarily increased after the operation. However, after a period of from two to three months, the motor power usually returns to at least the preoperative level. One may expect a uniform improvement in this type of case, and in many instances a complete



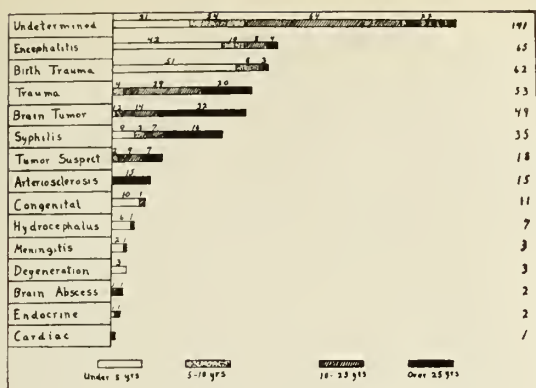


Fig. 2—The probable cause of epilepsy in a series of 467 cases as analyzed by Dr. Wm. A. Smith, Atlanta, Ga.

relief from convulsive manifestations is obtained. In some instances, the medical treatment of convulsions is continued postoperatively.

Bony defects in the skull overlying such scars are always repaired with either a sliding bone graft or a celluloid plate. The latter procedure has yielded better results in our experience than has the former.

In certain cases of Jacksonian convulsions where no circumscribed scar can be demonstrated, excision of the cortical center corresponding to the "trigger point" of the fit yields highly satisfactory results.

If a brain tumor is disclosed by our diagnostic study, a radical attempt is made to remove it. The surgery of brain tumors has undergone a remarkable metamorphosis in the past two decades. The first crude attempts at removal have been supplanted by a refinement of technique unsurpassed by any branch of surgery. Electro-surgery has made possible the removal of certain tumors which only five years ago would have been considered inoperable. In addition to these advances in technique, new knowledge of intracranial physiology and pathology has given to the surgeon a firmer basis upon which to work. As an example, the life history of every tumor of the nervous system is so well known that we are able, in the majority of instances, to prophesy preoperatively not only its location but its probable structure.

Contrary to popular belief, about 50 per cent of all brain tumors are benign, and most of these are capable of being removed by modern surgical methods. It is possible with the most malignant ones to give a survival period, in which the patient is essentially normal and capable of enjoying life, comparable to malignant tumors of the gastrointestinal and genito-urinary tracts.

The brain is not an unusual place for new growths to occur. Bailey and Cushing (1) in their Monograph on Neuro-pathology state

that "of all the organs of the body, with the possible exception of the uterus, the brain appears to be the most frequent seat of neoplastic disorders." Furthermore, brain tumor is probably the most frequent cause of epilepsy developing after the third decade of life.

Porencephalic cysts are not infrequently found to be the cause of convulsions. When these are demonstrated by the encephalogram, operation is advised, because frequently associated with the porencephalic defect, dense adhesions between the meninges and the surrounding brain tissues are found. In our experience, when scar tissue of this type is excised, the convulsions have always improved.

#### MEDICAL TREATMENT

Let me state again for sake of emphasis that no treatment either medical or surgical should be instituted until every effort is made to ascertain the underlying cause, and when once this cause is found, efforts should be made to eradicate it. I shall discuss the medical treatment of epilepsy under four headings: 1. General hygiene. 2. Drug therapy. 3. Ketogenic diet. 4. Dehydration.

**General Hygiene.** It is most important that the patient subject to convulsive seizures should lead a carefully regulated life as free as possible from emotional stress, mental and physical fatigue. A moderate amount of daily exercise in the open air is advisable. Alcohol and all stimulants should be eliminated from the diet. If the patient's occupation is such that attacks endanger himself or co-workers, it should be changed. Likewise, he should not be allowed to operate a motor vehicle or engage in any recreations where, should he have an attack, his own life or that of others would be endangered.

Proper elimination is an essential feature of the routine.

Because of the stigmata associated with the term "epilepsy" in the minds of the laity, physicians are reluctant at times to tell the family or patient the true condition. This point of view is wrong. If it has once been established that the patient is suffering from epilepsy, the responsible member of the family should be told. This not only promotes better cooperation from the standpoint of treatment but avoids having the patient or his family discover the true nature of the malady from sources other than their medical advisors.

**Drug Therapy.** For the control of the seizures, drug therapy is by far the simplest method. The bromides have for years been the generally accepted medication for the epileptic. With the introduction in 1912 of phenobarbital (luminal) as a nerve sedative, this drug has practically replaced the bro-

mides in popular favor. These two drugs, given singly or in combination, do control in a fairly satisfactory manner the number and severity of the seizures. Their beneficial effects are in the majority of instances only temporary, as a tolerance is developed rapidly. Furthermore, these drugs, in sufficiently large doses to give results, administered over long periods of time, are injurious to the general well being of the patient. There will always be a group of patients in which, for one reason or another, more exact and desirable methods cannot be instituted. Drug therapy, in this group, will be the only method available. Luminal is perhaps the most satisfactory drug to use. It should be given in doses sufficiently large to control the convulsions. In many cases, four and a half to six grains daily will be required. This drug should never be prescribed unless the patient returns to the physician for frequent observation, so that the dose may be properly regulated. The maintenance dose should be as low as possible to control the seizures. Occasionally, one sees a patient who cannot take luminal because of the toxic effects. In such an instance, bromides are used instead. In our experience, neither luminal nor bromides affect favorably petit mal seizures, and their effect on Jacksonian seizures is inconstant.

**Ketogenic Diet.** Dietary treatment has been perhaps the greatest single advance in the treatment of epilepsy. It has been known for centuries that fasting will stop convulsive seizures temporarily. While fasting as a means of treatment has been discredited by most investigators because it does not give permanent results, yet the chemical changes observed in the body as a result of fasting form the basis for all modern dietary treatment of the condition. Careful investigation has shown that when a patient becomes free of seizures from fasting, the sugar content of the blood is low and acetone bodies, i. e., acetone and diacetic acid, are present in increased quantities in the blood. Also the carbon-dioxid combining power of the blood is diminished and the hydrogen ion concentration is slightly reduced. Wilder (12) and later Peterman (9) first suggested that the improvement associated with fasting is not attributable to the starvation itself but to the ketosis with which starvation is naturally associated. Acting upon this assumption, they placed their epileptic patients upon a diet which was calculated to produce a constant ketosis. Many authors, notably Talbot (11), Helmholtz (7) and others, have experimented along the same lines, and their efforts have been crowned with considerable success. In many instances, there has been a complete cessation of the attacks over a

period of years, and in others, a decrease in the number and severity of seizures has occurred. Furthermore, it has been demonstrated, beyond doubt, that a patient may remain upon this diet indefinitely without detrimental effects to the general health. In fact, normal growth and development take place even in the young. Some authors believe that patients maintained on a ketogenic diet are freer from intercurrent illnesses than on a normal diet. This is true particularly in the case of the common cold.

Many factors contribute to the success or failure of the ketogenic diet. The same conditions which determine the effectiveness of the treatment of diabetes determine also the effectiveness of the dietary treatment of epilepsy. Success cannot be expected when there is mental deterioration, or when the patient or family is uncooperative. Eternal vigilance is necessary, not only for the patient, but for those responsible for his dietary care. Unless the diet is planned correctly and executed with absolute precision, it is a waste of time for all concerned. The patient or a responsible member of his family must be taught the proportions of fat, carbohydrate and protein in the various foods and must know how to adjust these various food constituents so that the proper balance is maintained. The principle of producing ketosis depends upon an incomplete combustion of fat. For fats to be broken down completely in the process of metabolism, it is necessary that a certain carbohydrate—fatty acid ratio be maintained in the tissues. It is only by reducing this amount of carbohydrate below the level of incomplete fat combustion that the ketone bodies are liberated into the circulation. A break in the diet by the ingestion of more carbohydrate than is allowed may spoil completely the state of ketosis for a period of 24 to 48 hours. In patients who have responded to the diet and who have a recurrence of convulsive seizures, some break in the diet usually can be demonstrated.

In our experience, it is futile to attempt the diet unless the patient and some other responsible person have been instructed thoroughly in the practical side of dietetics. Hospitalization for a week or ten days is essential. First, encephalographic studies are made, and following this procedure, the patient is placed in charge of the dietitian for instructions into the theory and practice of the diet. He is taken to the diet kitchen and taught to prepare his meals under supervision. He learns to test daily his state of ketosis by analysis of his urine for diacetic acid. When he is sufficiently conversant with all the details, he is discharged from the hospital and is instructed to report to the



physician or the dietitian when any change is to be made in the diet, or when the diet fails to produce the desired ketonuria.

It is possible for patients in any walk of life to learn this diet and adhere to it rigidly. We have records of laborers who have learned the diet and who have carried it out over a period of years. Young children offer the most difficult problem, because, in many instances, it is impossible to make them understand the importance of rigid adherence to the routine. Many of them will steal candy or sweets, and, of course, spoil the state of ketosis. Some children learn very early the importance of rigid adherence. Dr. Tom Marks of Lexington, Kentucky, tells a most interesting story of one of his little patients, who had been on the diet for several months. This boy came into a corner drug store with three of his playmates. The playmates each bought an ice cream cone, and this little fellow showed no inclination to obtain one. A travelling man standing in the store noticed that the boy did not have a cone, and feeling sorry for him, he suggested that he would be glad to buy the child one. The boy looked up at him and said: "Thanks, Mister, but I would not eat one of them things for fifty dollars. I would be sure to have a fit tonight if I did."

**Dehydration.** The human body is composed, in a large part, of water. It keeps the various elements of the body in solution; transports food to the tissues and carries the waste products to be excreted. The regulation of water, therefore, in the process of metabolism is a most important factor. Dehydration results whenever the fluid intake is less than the fluid output. Dehydration occurs in the febrile diseases, fasting, diarrhoea, low carbohydrate—high fat diet, and when there is a voluntary limitation of fluid intake. The possible relationship between hydration and dehydration to epileptic seizures has attracted the attention of many investigators. Since the days of Hippocrates, a moist brain has been thought to be associated with epilepsy. McQuarrie (8) in 1929 showed that there was a tendency for the epileptic to store water during the active stage of the disease in amounts that were harmful. He also showed that convulsions tend to occur when a water balance above a certain magnitude is established, and that after dehydration occurred, convulsions, in many instances, were prevented. He found that it was possible by a sudden increase in the water intake to throw the severe epileptic patient into convulsions, and by dehydrating him to relieve the convulsive manifestations. Temple Fay (5) has been the chief proponent and advocate of this method of treatment. On a basis of his own experience, he finds this

method has given relief to patients where other methods have failed.

Dehydration automatically occurs in patients upon the ketogenic diet. Barbour (2), in his experimental work, demonstrated that dogs on a high fat—low carbohydrate diet take voluntarily approximately 50 per cent less water than animals under similar environmental conditions will take on a normal mixed diet. From our own experience, we find that patients on a high ketogenic ratio do not desire water in large quantities. We have for several years limited the fluid intake of epileptic patients in connection with the ketogenic diet and have found that they remain comfortable on a fluid intake as low as 600 c. c. per 24 hours. It is our belief that the combination of ketosis plus dehydration is the method of choice in the treatment of the epileptic.

In closing, let me say that for one to fully appreciate the change that has occurred in the attitude toward the treatment of epilepsy, he must read the literature of a decade ago and compare it with that of recent date. More exact information has taken the place of surmises, conjectures and pseudo-knowledge. I do not mean to imply that the problem is solved; it is far from that state, but I have attempted to show in this paper that sufficient scientific advances have been made to justify our substituting a spirit of hope and expectancy for that of utter despair when dealing with the epileptic patient.

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#### Studies in Metabolism of Sodium r-Lactate: I.

In seven essentially normal children Hartmann and Senn studied the effects of the intravenous injection of from 4 to 7 cc. of molar solution r-lactate per kilogram of body weight, with the following results: 1. The racemic mixture is practically completely metabolized in from one to two hours. 2. The conversion of lactate into dextrose is apparent from the uniform rise of the latter in the blood. 3. The liberation of the sodium ion is practically quantitative, the base appearing in the body fluids chiefly as sodium bicarbonate. 4. Excretion of excess base into the urine takes place promptly, and alkalosis is usually of short duration. 5. During the period of alkalosis, no signs of tetany were noted.

## ORATION IN MEDICINE

## CHRONIC HYPOCHROMIC ANEMIA\*

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The more recent recognition of the factors which are necessary for normal blood production, along with our increased knowledge of the clinical and haematological manifestations produced by a deficiency in one or more of these factors, constitute a scientific basis for rational therapy in the deficiency anemias.

Our present knowledge indicates that normal haematopoiesis is dependent on adequate supplies of: (1) iron, (2) copper, (3) at least, two substances present in whole liver, (4) vitamin C, (5) vitamin B<sub>2</sub> (autolyzed yeast) and (6) an intrinsic gastric factor. Any lack of one or more of these factors will produce anemia.

In this paper I propose to discuss the so-called "secondary" anemia which is associated with certain dietary deficiencies or altered gastrointestinal function, and which is promptly alleviated by the use of iron in adequate doses.

There are many names given to this condition: chronic chlorosis, chronic microcytic anemia, simple achlorhydric anemia, etc. I shall prefer to speak of these anemias of low color index as hypochromic to describe a state of deficiency of hemoglobin rather than a deficiency of cellular substance as indicated by the word microcytic.

Although the condition appears to be comparatively common, so little attention has been given it in medical reports that it is seldom recognized in practice.

The underlying cause of the deficiency of iron is not clear. A deficient absorption of iron from the gastrointestinal canal, or a faulty absorption through arteriosclerotic vessels, or a faulty diet leading to chronic iron starvation, or the lack of some factor in achlorhydric gastric juice which aids the absorption of food iron, have been advanced as possible causes.

Pathologically, there is a normoblastic hyperplasia of the bone marrow. This hyperplasia may accompany both increase and decrease in the output of cells from the marrow. Nucleated red cells may appear in the peripheral blood, following hyperplasia of the marrow, but are not an evidence of increased blood formation unless they are accompanied by an increased number of reticulocytes. When sufficient iron is not supplied, whatever the cause, the erythroblasts multiply and the marrow encroaches on the shafts of

the long bones, but the cells fail to mature and the reticulocyte counts show that few cells are being delivered into the blood stream. Pathological microcytes are present and are replaced by normocytes during spontaneous remissions or following successful iron therapy.

Clinically, chronic hypochromic anemia may be described as an anemia of great chronicity, occurring most often in middle aged women who have often had a somewhat inadequate diet, high in carbohydrates, low in proteins and green vegetables; who sometimes have marked abnormalities associated with craving for unusual foods; who have had recurring pregnancies and are often afflicted with menstrual disorders (amenorrhoea, menorrhagia, dysmenorrhoea, irregularity of flow or late appearance of periods); and who complain of vague cardiac, nervous and digestive disturbances. Breathlessness, weakness, ease of fatigue, palpitation, giddy and fainting spells, anorexia, dyspepsia, constipation, exaggeration of symptoms from other pathological conditions, more rarely sore tongue, dysphagia, transient numbness and parasthesias, at one time or another dominate the clinical picture.

The gastrointestinal symptoms are exceedingly chronic and it is difficult to get any exact information about their onset. The anorexia is generally more marked in the mornings. Discomfort is worse after meat and least often after carbohydrate foods. The patients often complain of painful fissures at the angles of the mouth. Although the tongue may be angry and red in the more severe anemias, it is uncommon to obtain complaints of such soreness. Dysphagia is rare (Plummer Vinson Syndrome). Constipation is a troublesome and relatively constant symptom. Symptoms of colitis and diarrhoea are more often seen in those anemias with achlorhydria. Achlorhydria or hypochlorhydria is a common but not an invariable finding.

Many of the symptoms of hypochromic anemia are cardiac in origin being due to deficient blood supply and the resulting lowering of myocardial reserve. There may exist an actual dilatation of the heart and edema of the cardiac type. When the hemoglobin is reduced to a much greater extent than the red blood cells, dyspnoea may become such a marked symptom as to incapacitate a person from daily work although the red cells number above four million. Cardiac pain, resembling that typical of angina, has been observed.

Clinically, these individuals are usually poorly nourished, neurotic and introspective. There is a marked pallor and the sclera is of a bluish color. The tongue is more often

\*Delivered before the Kentucky State Medical Association, Louisville October 3, 4, 5, 6, 1932.



smooth and, in a few cases, marked atrophy of the papillae is present. Fissures and painful cracks at the corners of the mouth are more or less a characteristic. Frequently, the nails, which may be unduly brittle, tend to split longitudinally; are commonly flat and sometimes "spoon shaped" (kononychia). Easy bruising and the presence of ecchymosis are common. The spleen is palpable in about one-third of the cases and is usually accompanied by slight enlargement of the liver. The heart may be enlarged and haemic murmurs are frequent. Slight edema of the extremities is not uncommon.

From the laboratory aspect, chronic hypochromic anemia is characterized by a low color index. Red cells which are normal or smaller than normal size, (the red cells frequently, though not necessarily, present in normal numbers) are achromic in the sense that they have pale centers or diffuse lacking in density of hemoglobin color. There is no evidence of increased hemolysis, for the serum bilirubin is always low. The fractional test meal more often reveals an achlorhydria or hypochlorhydria, an increased mucus content and a rapid emptying rate. A normal gastric content is not inconsistent with hypochromic anemia.

The most important consideration in the treatment of chronic hypochromic anemia is to give adequate amounts of iron in an assimilable form until the desired effect is produced. Small doses and injections are useless. It is not known why such large doses are necessary, and little is known of the fate of the iron, other than its storage in the liver. No untoward symptoms were noted as a result of the large doses. Contrary to the usual belief, these large doses of iron are well tolerated, and rarely cause digestive disturbances or constipation. In treatment, I prefer the iron and ammonium citrate which is readily soluble and easily taken. The minimum effective dose is 60 grains a day. I prefer 90 grains. A convenient method of administering iron and ammonium citrate is in a 50% solution in doses of 60 to 120 grains daily. Because of the occasional diarrhoea induced by large doses of iron, it is well to begin with a dose of 15 to 30 grains a day, gradually increasing to the maximum dosage. When once the hemoglobin has reached the 90 to 100 per cent level the dose is reduced to 30-45 grains daily. Remissions occur in the majority of these patients when iron is discontinued. Intensive treatment over three months or even nine months may be required to bring the hemoglobin to a normal level. Our present knowledge indicates that iron in adequate amounts should be taken indefinitely. The results of treatment with maximum doses of iron are uniformly good. The hemoglobin

rapidly returns to normal, the microcytes disappear from the blood and the patient experiences a feeling of well being that was formerly unknown. The symptoms referable to the alimentary tract, the nervous system, and heart, entirely disappear. The nails and tongue changes become less marked and, in some patients, entirely disappear.

The presence of infectious processes may materially delay the action of iron. Menorrhagia may be a very troublesome complication. In certain instances, as soon as the hemoglobin has been raised by iron to about 70 per cent, a previous amenorrhoea gives place to menorrhagia. Omission of iron, rest in bed, calcium gluconate orally, usually arrest this condition and the periods become normal in amount and duration. When the menorrhagia is intractable, it is unwise to await a natural menopause. Treatment by x-ray or subtotal hysterectomy should be recommended early.

Often we see patients in whom the symptomatology and clinical findings are the same as those observed in chronic hypochromic anemia, although there is no marked reduction in the hemoglobin. Several of these individuals with a hemoglobin above 80 per cent have been benefitted dramatically by large doses of iron. Transfusions may be temporarily effective but are soon followed by a relapse. Liver extract, liver ash, desiccated stomach, and hydrochloric acid are without effect. Copper is present in small amounts in the common iron salt and perhaps exerts a synergetic action. Copper, in larger amounts, does not seem to enhance the blood regenerating power of iron. Frequently, where there is a sluggish rise in hemoglobin in response to iron therapy, the addition of whole liver to the diet causes the hemoglobin to rapidly rise to normal, and, at the same time, causes a further increase in the red blood cells.

Fifty-four cases of chronic hypochromic anemia were studied by the author in a series of 120 cases of achlorhydria observed at the Lexington Clinic. There were 48 females and 6 males. The average number of erythrocytes was 4,300,000 per c. m. m. and the average hemoglobin content of the blood was 65 per cent; the lowest red cell count was 2,330,000 and the lowest hemoglobin measurement 40 per cent. In some patients, the red cell count was above normal, but a considerable hemoglobin deficiency existed. The average color index was 0.7 (lowest 0.4 and highest 0.9). The average leucocyte count was 7,000. In the series there were 3 cases of the so-called Plummer-Vinson syndrome. In 21 cases of chronic hypochromic anemia that the author has treated for a period sufficiently long to show an excellent response to oral iron therapy, the blood values have

been considerably improved or restored to normal, while there was at the same time great symptomatic improvement. In these cases the average red cell count before treatment was 4,100,000; after treatment 4,500,000—an average gain of 400,000 cells; the average hemoglobin before treatment was 57 per cent; after treatment 83 per cent—an average gain of 26 per cent.

Case I. The first case which I wish to present is that in a single woman, 43 years of age, who came to the Clinic in February, 1930. Her complaints were weakness and ease of fatigue for two years. Pyrosis, sour eructations, "hunger pain" were annoying symptoms as far back as she could recall. An appendectomy and later a cholecystectomy failed to relieve these symptoms. The essential points of interest, in the physical examination, were pallor and a spleen which was palpable three finger breadths below the costal margin. The patient appeared to be well nourished. A fractional Ewald test meal over a period of one hour demonstrated no free hydrochloric acid to be present. The total acidity remained below 12. Red cell count was 4,800,000 per cubic millimeter. Hemoglobin 44 per cent; white cell count 5,800 per cubic millimeter; anisocytosis III, poikilocytosis I; color index 0.47. Icteric index 3. Fluoroscopy of stomach, duodenum and colon negative. The diagnosis in view of these findings was idiopathic hypochromic anemia with achlorhydria. The patient was put on 60 grain doses of iron citrate daily. At the end of six weeks there was marked symptomatic improvement. The red blood count was 4,760,000, white blood count 12,300, hemoglobin 77 per cent. Improvement continued steadily and at the end of ten weeks the red blood count was 4,960,000, hemoglobin 90 per cent. Her condition remained satisfactory and during the next three months she took iron at irregular intervals. At the end of eight months the spleen was no longer palpable.

Case II. A married white woman, age 42, gave as her chief complaint chronic indigestion. Over a period of 15 years she has complained of frequent attacks of pyrosis, sour eructations, epigastric burning after meals relieved by diet and soda. Diarrhoea and constipation suffered for two years. Ease of fatigue, exertion dyspnoea, palpitation, precordial pain on exertion, and edema of feet and legs were reported.

On physical examination, she was found to be well nourished and a little over weight. Mucous membranes were pale. Systolic murmur was found over mitral area. Heart was moderately enlarged to right and left. Blood pressure was 120/80. Electrocardiogram found negative. Red cell count was 4,240,000,

hemoglobin 45 per cent, color index 0.53, cells were small and achromic. Free hydrochloric acid was absent to fasting stomach and 15 at the end of one hour.

Therapy consisted of 90 grains of iron daily. At the end of four months red blood cells counted 4,640,000 and hemoglobin 80 per cent. Her symptomatic improvement was satisfactory and progressive.

Both of these cases are representative of chronic hypochromic anemia with achlorhydria and hypochlorhydria respectively. The first patient complained of ease of fatigue and chronic dyspepsia. Her spleen was enlarged. The second patient complained chiefly of vague cardiac symptoms, breathlessness, palpitation, precordial pain, easy bruising and left hypochondriac pain. The cases present the following features in common: both had been dieting for years because of dyspepsia; both had atrophic flabby tongues; both had the hypochromic blood picture; one had complete absence of hydrochloric acid, and in the other it was markedly diminished; and, finally, both improved promptly and markedly with iron therapy.

Case III. A white girl, age 25, gave as her chief complaint ease of fatigue and nervousness. During the past eight months ease of fatigue, palpitation, exertion dyspnoea, alternating diarrhoea and constipation, dyspepsia, nausea, and weakness were more or less constant. Diet consisted mostly of carbohydrates and patient had a craving for "coffee grounds."

Clinical examination revealed a pale anemic, fairly well nourished girl. Her red cell count was 4,400,000, hemoglobin 52 per cent, color index 0.6, the cells were small and pale. Achlorhydria was present. After six months, following a daily dose of 90 grains of iron and ammonium citrate, her red cells were 4,480,000, hemoglobin 96 per cent and all symptoms were relieved.

Women of this type with multiple symptoms and absence of gross clinical findings are too often called "neurotics," "neurasthenics," and are said "to have a nervous breakdown." The perverted appetite is of particular interest in this case because no such craving was present after successful iron therapy.

Case IV. A married housewife, age 34, gave as her chief complaint weakness, fainting attacks and ease of fatigue. During the course of her third pregnancy, following closely after a miscarriage at six and twelve weeks respectively, there were frequent fainting spells preceded by symptoms of dizziness, ringing in ears, weakness and dull aching in occipital region. Attacks were as frequent as every two to three days or there might be intervals of two to three months. Following



parturition she was free from above attacks but weakness and ease of fatigue continued. At the present time she is in the sixth month of pregnancy and has complained of the above symptoms since the first month. Recently, precordial pain, accompanied by a sense of suffocation and followed by nausea and extreme weakness, has occurred at frequent intervals.

Clinical examination showed a well nourished, anemic young woman in her sixth month of pregnancy. The heart was slightly enlarged and a loud haemic murmur was heard over the base. Blood pressure was 120/90. Her red blood cell count was 4,100,000, hemoglobin 56 per cent, leucocytes 8,800, color index 0.7.

Sixty grains of iron citrate was prescribed daily and, because of a slow response in hemoglobin, whole liver was added. Within three weeks, following administration of iron and liver, the patient experienced an absolute freedom from all symptoms. During the next ten weeks she was able to take the iron and liver at intervals. At this period the red blood cell count was 4,700,000, hemoglobin 73 per cent. One month later hemoglobin 67 per cent. Patient was taking only 15 grains of iron citrate daily at this time because larger doses caused her baby to have diarrhoea. This was soon overcome and on adequate doses of iron over a period of eight weeks the red blood cell count was 4,860,000, hemoglobin 90 per cent.

Idiopathic hypochromic anemia is often observed following rapidly recurring pregnancies. Shortness of breath, breathlessness, syncope, precordial pain, and the murmur in the above patient strongly suggest primary cardiac disease. As the result of long standing anemias there is some cardiac enlargement and hemic murmurs are frequently heard. The enlargement tends to decrease as the blood approaches normal. This case further illustrates the effect of whole liver in accelerating the rapidity of response in hemoglobin. Iron was used during the last eight weeks and the progress was entirely satisfactory. As in this case, whole liver in conjunction with iron sometimes accelerates the formation of hemoglobin.

#### SUMMARY

1. The etiology, pathology, clinical and laboratory features and treatment of chronic hypochromic anemia is discussed.

2. Fifty-four cases of chronic hypochromic anemia with achlorhydria are summarized.

3. Results of treatment of twenty-one cases of chronic hypochromic anemia is presented.

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#### ORIGINAL ARTICLES

##### A CLINICAL STUDY OF PYRETO-THERAPY (FEVER TREATMENT)\*

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Pyretotherapy or the cure of diseased states by the elevation of temperature, in other words, fever, is no new clinical manifestation. For ages, this has been observed, for many cases were recorded, even by the early Greek, Egyptian and Roman physicians and are to be found during the succeeding centuries in medical records, especially through the medium of hot baths. Its attempted production, by both chemical and physical means, is likewise old. The knowledge of its clinical value, as shown in intercurrent disease, was common. The induction of fever for specific curative results has many times been attempted. Von Jauregg utilized fever and made known his observations prior to 1887.

But the production of pyretotherapy by high frequency currents is *new*. To be able to produce fever at will, varied in the rapidity of its elevation, its intensity, its duration, and capable of such control, that even temperatures of portions of a degree of fever, may be maintained indefinitely is something heretofore undreamed of by the medical profession. Another interesting feature to be noted is its field of successful therapy. It is curative in chronic, usually incurable, crippling and disabling diseases, especially those of the central nervous system and joints, that have heretofore been the *bête noir* of therapy, cases that were often difficult of giving even relief symptomatically. We can now say that this therapy has opened a new field of hopefulness for the hopelessly af-

\*Read before the Muldraugh Medical Society, Lebanon, August 11th, 1932 and before the Louisville Society of Medicine July 7th, 1932.

flicted. The incurable have become curable.

Fever tends to limit pathological conditions. Nearly every self limiting disease process is accompanied by febrile manifestations. Chronic infective processes, non febrile in character, are not as a rule self limiting. It has been found experimentally and clinically that the induction of fever will produce beneficial results. Different infections produce different temperatures of varying duration. In order to produce curative results, various micro-organisms have been tried. The patient was infected and fever, frequently very high, was brought about with varied results. Protein and bacterial therapy is now considered useful and effective. We can not as yet give a clear or concise explanation of the production of fever by many specific and non-specific agents, nor do we fully understand how the immunizing power of the body is aroused by the non-specific agents introduced into the parenteral circulation. The fever certainly stands in causative relation to the subsidence of the disease. This is proven by therapeutic fever induced by the high frequency current, for the current provokes heat and fever and does not introduce any confusing factor. Modern therapeutists do not aim to reduce or treat fever. There were some who maintained that fever was an essential feature of the curative result, especially Simon Baruch, whom I heard forty years ago state when he was employing hydrotherapy in the treatment of typhoid fever that those who used acetanilid, (then in vogue) for the reduction of fever, only gave their patients the grim satisfaction of dying without fever. McCallum suggests that fever be not interfered with as it was probably a favorable reaction of the body to the infection, and that possibly immunizing bodies were thrown into the circulation at higher temperatures that were not produced at lower ones. He believes the febrile process is advantageous to the body, and that fever develops protective substances that counteract the injurious and destructive agencies that have invaded the body.

From time immemorial, *hot baths* have been used and were believed to be of especial value in certain nervous and luetic diseases in their various manifestations. The value was not ascribed to the heat, but rather to some occult ingredient in the water, especially the emanations of radio-active substances. It should not be forgotten that in addition to taking the hot baths, medication both general and anti-luetic was administered, the latter often in very large doses. Schamberg and Tseng have proved that it is possible to raise the body temperature by baths as high as 106° F., and furthermore safely. They started with a temperature of 98° F.

and gradually increased the temperature of the water to 110-114° F. The rise of body temperature was the gauge of duration of the bath. The baths were taken upon an empty stomach and the body completely covered with the water up to the neck. An ice bag was kept constantly on the head. They found in addition to the rise of temperature that these baths produce a transient leucocytosis, followed by a brief reduction in the white cells, with a slight rise in systolic blood pressure and frequently a great drop in diastolic pressure, both of temporary duration. They noted about ten per cent reduction in the cholesterol but there was no material influence upon the blood urea, urea nitrogen, blood uric acid, the proteolytic or lipolytic enzymes. They further noted that the baths did not have any marked effect upon the Wassermann reaction. The reason for this would seem to be in my opinion, that the baths were not sufficiently long continued to produce this effect.

Mahrtens and Poupirt compared the results obtained by hot baths and the malarial treatment in paresis and reached the conclusion that the former is simpler. In the use of baths the temperature can be maintained for several hours. They mention the fact that the fever produced by baths is under perfect control. It can be maintained at any degree for any length of time. They applied it for two hours on alternate days although they noted that these baths continued daily for at least six weeks did not deplete the patient and in fact, the patient may still gain in weight and maintain his strength. It is even probable that the hyperpyrexia tends to intensify the therapeutic effect of anti-syphilitic medication. They noticed frequent amelioration in the symptoms of the Parkinson's Syndrome and in the same syndrome following Encephalitis as well as in Multiple Sclerosis. They did not obtain any results in Amyotrophic Lateral Sclerosis. Their methods were more or less crude in that they employed an ordinary bath tub and bath thermometer. The continuous bath tub admits of a more satisfactory control of the fever. They believe that a mouth temperature of between 103° and 105° F. is sufficient. The routine bath they gave lasted one hour, but it is feasible to maintain the patient's temperature by wrapping him in blankets. They believed that hyperpyrexia by baths, because of their safety and simplicity have a field of usefulness in early cases of vascular disease, with symptoms of intermittent claudication. Arterial sclerosis with calcification has improved and is greatly benefitted by hyperpyrexia and should be given a faithful trial.

Davies and Holmes report their findings in fifteen experimental baths with three nor-



mal subjects at the Royal Bath Hospital, Harrogate, England. The temperature of the baths range from 98° F. to 104° F. These temperatures varying within a range of plus or minus 1° F. Most of the baths were taken in plain water. In all the experiments, it was found that the pulse rate was increased by the bath, and that there was an initial rise almost immediately after entering the bath. The reason for this rise is not clearly apparent. The temperature rose, which they ascribed to the effect of the temperature on the sino-auricular node. The systolic blood pressure either increased slightly or was maintained, while the diastolic pressure was always reduced, sometimes to a considerable extent. This resulted in increased pulse pressure. The circulation rate was somewhat increased but not to the same degree as the pulse rate and pulse pressure.

Lindemuller reported the use of hot baths in the treatment of 12 cases of Multiple Sclerosis. The baths were given daily or every second day. The patients were immersed to the neck in a continuous bath at 104° F. for 10 minutes, and then the temperature of the water was gradually raised to 110° F. and kept at this level for 30 minutes and again brought down to 104° F. for twenty minutes, making the duration of the bath one hour. Patients were then wrapped in woolen blankets for two to three hours, until the mouth temperature became normal. Nine of the twelve patients gained weight during the course of baths.

Lately, Cody and Ewerhardt studying the action of the hot full bath commencing at 100.4° F. (38° to 41.6°C) and gradually raising the temperature to 104° F.-110° F. (42°-45°C). The patient's temperature rose to 102.3-106° F. (39°-41°C.) in twenty to forty minutes. They maintained the bath at the highest temperature twenty to forty minutes, after which the patient was gradually cooled off in a tub or by a cool shower bath. These observers concluded that the hot bath was not harmful to the Wassermann fast syphilitic but exerted a beneficial clinical effect upon the patient. They also used drug therapy.

The first writings upon the possibilities of fever production in this country by electric currents were published by Frederick de Kraft in 1913. After describing what he believes to be a purely molecular disturbance, a mechanical agitation resulting from the oscillation of the high frequency current, he speaks of a resultant rise in temperature with perspiration. In September of the same year, he states that Zimmern and Turchini, in twenty minutes raised the bodily temperature 0.3, to 0.4° C. in a dog, and that Schittenhelm had used currents up to 4 amperes

on very large dogs and could so raise the temperature that death resulted. When electrodes were used, with a current of 2.3, amperes, (2300 milliamperes) the rectal temperature of the dog rose to .4° C. The dog was packed in cotton wadding.

In de Kraft's experiments, he used his then new multiple spark gap. In October, 1914, he calls attention to the work of von Zeynek, conducted in 1907, using active micro-organisms injected into a dog, subjecting one portion of the body injected to the heat of the high frequency current, and another part also infected was not so treated. The infected parts subjected to the heat showed no recognizable alteration of structure, while those untreated showed virulent cocci present. Laquer injected pure cultures of bacteria into both knees of a rabbit, care being taken that both sides received an equal quantity. Immediately afterward, one of the joints was diathermatized for a half hour. When the warming process was ended, both joints were punctured, under sterile precautions and a few drops of blood inoculated on proper media. Gonococci, cholera vibrios, pneumococci and pus cocci were employed. The heated joint showed only one slight growth in one tube. He believed that the resulting arterial hyperemia, the increased lymph flow, helps the body defenses.

In 1916 de Kraft calls attention to Hirschberg's investigation on rabbits, in which he has shown that when an electrode was placed over the abdomen and another over the kidneys, and a strong current was passed intense hyperemia of the muscles of the back and of the kidneys, together with isolated hemorrhages were some times produced.

In November, 1918, de Kraft and Titus published an article upon the use of diathermy, auto condensation and galvanism in the treatment of syphilis. Since that date, the author has actively employed this method. They say; "the degree of heat procurable may be from a very gentle glow to an intense heating effect of the entire body, resulting in a decided rise in bodily temperature, and profuse diaphoresis. The general treatment consisted of auto condensation, and special and specific localized conditions by means of diathermy. In treating the cerebrum, the current was gradually increased to 300-400 milliamperes.

Since 1918, the author has constantly employed cerebral and spinal diathermy employing currents of from 300 to 700 milliamperes to the brain, and one thousand to fifteen hundred milliamperes to the spine, and immediately following the cerebral and spinal diathermy with galvanism.

The commencement of the really active recognition of hyperpyrexia, dates from about

ten years ago when von Jaregg utilized malarial fever as a curative measure in paresis. The almost miraculous results in such a hopeless disease fixated, not only medical but lay attention on his results, although von Jaregg, had utilized fever as a therapeutic measure and made known his observation prior to 1887. His work stimulated the study of artificial febrile production until now it is an accepted fact that fever is one of the most effective defensive measures of the body against invading organisms, and especially in diseases and disorders of the nervous system and joints although as previously stated, it has proved a valuable adjunct in the management of luetic lesions, especially of a chronic nature.

In the last ten years the medical journals have been filled with the value of the malarial organism in paresis. The results have been spectacular. The apparently hopeless, the incurables were in a large percentage restored to health and usefulness. We should from this result in such a hopeless disease as paresis, take to heart the lesson that we must never be dogmatic about anything in medicine.

It therefore seems worth while to attempt to perfect a method of producing these temperature curves without having to inject disease producing organisms or toxic substances into the patient's circulation; also to determine whether the beneficial effects are produced by the elevation of body temperature *per se*, or whether they are brought about by some bio-chemical reaction. To determine this point, it is obviously necessary to employ some method whereby the temperature of the body may be raised to any desired point, independent of the action of an induced infection or intoxication.

The successful treatment with high frequency currents depends on certain mechanical factors necessary to produce elevation of temperature, maintain it and prevent burning the patient. The prime requisites are properly constructed electrodes, a machine powerful enough to give sufficient energy and proper insulation of the patient. The electrodes must have an extensive edge because the current has a tendency to concentrate along the edges. Fenestration of electrodes is therefore absolutely necessary. Furthermore, when extensive areas of a patient are treated with large amounts of current, ranging between 4,000 and 6,500 milliamperes varying resistances are encountered depending largely on body thickness, and individual resistances. This is especially true when the treatment is carried on for many hours. In order to force four, five or six thousand milliamperes through the body with safety, the electrodes should be as large

as possible. The entire back must be covered by one electrode and the chest and abdomen by two other electrodes. It should be remembered that the region just above the iliac crest is the thinnest part through which the current will have to travel, and here burns are apt to be frequent. The machine must be very powerful and absolutely under control. Heat alone is desired. The current should be smooth, and absolutely free from any faradic effects. The machine possesses fundamentally an oscillatory circuit consisting of inductance condensers and spark gap. The superior results obtained from such a machine are in large measure due to the design and mechanical construction of its various parts. The correct design, construction and assembly of the individual units, with reference to each other and to the completed whole is of utmost importance to the proper functioning of the equipment.

The oscillatory circuit consists of a set of four spark gaps, an induction coil, the amount of inductance of which can be varied by means of a frequency switch and a set of condensers and the effective capacity of which can be varied by means of a power switch. By increasing the capacity in the circuit the output is increased. The discharge is of an oscillatory nature, the frequency of which is dependent upon the amount of capacity and inductance in the circuit. In order that a smooth, uniform current be delivered, the parts of this circuit must be constructed to properly dissipate the heat produced. The amount of heat generated in the wire of the circuit is so small as to be negligible. Considerable heat is produced at the spark gaps and it is very essential that these be properly constructed in order to maintain a smooth current. When a discharge takes place, between the spark gaps, the resistance across the gaps becomes very low and this resistance must be built up to prevent an arc taking place across the gaps and to quench sparking so that the condensers can again be charged. For this purpose, the spark gaps must be properly cooled. Spark gaps are constructed with a large sparking surface so that the points do not become too hot. To further increase the cooling effect radiators are provided to which the heat generated at the spark surfaces is conducted and radiated into the air. In order that heat production may be maximum, these radiators are tooled out of a solid block of brass. This form of construction will carry the heat away from the sparking surfaces considerably faster than a radiator composed of sections which are clamped together in some form or another.

The condensers are likewise designed to dissipate the heat generated in the dielectric.



The condensers are composed of alternate layers of copper and mica, which are clamped together by means of special aluminum clamps which are constructed in such a way as to provide a large amount of radiation surface to keep the condensers cool. To charge the condensers a step up transformer is connected to an alternating current source. This source usually consists of an 110 volt, 60 cycle power service which is connected to the primary side of the transformer and between 5,000 and 6,000 volts are delivered across the condensers on the secondary side. There has been considerable conjecture as to what should be the proper voltage for this transformer. Some have claimed that a high voltage is either necessary or desirable but a brief consideration of the physics of the production of heat by high frequency currents will show that a high voltage on the transformer is neither necessary or desirable.

Heat generation within the tissues of the human body is a function of the resistance and the current passing through it. According to Ohm's law, the current in any circuit is proportional to the voltage and inversely proportional to the resistance. As the resistance of the human tissue cannot be arbitrarily changed, a given voltage is necessary to produce a given current, and while in the case of diathermy circuits, Ohm's law in its simplest form cannot be applied to obtain the voltage, yet fundamentally the same reasoning applies. In practice a step-up transformer of relatively low secondary voltage, but of good regulation, is employed.

In order to provide some adjustment on the machine for different types of treatment, two means of varying the power have been provided. The first is by means of an intensity switch which regulates the power input to the transformer. A second means of varying the amount of power is through a power control that switches in or out of the circuit a certain amount of capacity. The frequency of the circuit is a function of the amount of inductance. If we decrease the inductance in a circuit, we increase the frequency, and *vice versa*. Various mechanical details are introduced including additional condensers which prevent the patient from receiving a shock, in fact the machine must break down in no less than four places before the patient could possibly receive a low frequency shock. Any one of these breakdowns would put the machine out of commission. Absolute safety has thus been provided against accidental electrical shock. In addition the author employs a time clock the cord of which is in the patient's hand and who can at any moment shut off the entire machine.

### TECHNIC

A special room should be set aside for this treatment. A bed with a firm mattress is provided and covered with three or four blankets, over which is spread a rubber sheet and over this a sheet preferably of Turkish toweling, which is an excellent absorbent of fluids. The patient, nude, lies upon the blankets and sheet after which a special jacket, for tightly strapping or lacing the electrodes is slipped under the back. The large fenestrated electrodes must be carefully rolled so that all edges are smooth in order to prevent burning. All connections to the electrodes are then inspected so that no arcing will take place. A special lubricant is of considerable advantage. The electrodes are pressed tightly to the body, and the jacket laced to hold them in place. The patient is covered with a turkish sheet, a rubber sheet and from six to ten single blankets, care being taken to tuck them well around the neck. A linen towel is then placed over the blanket ends to prevent any discomfort from the touch of the blanket to the neck. We employ a special treatment clock so arranged that the slightest pull upon a cord will ring a bell and turn off the main source of current supply and hence the entire apparatus. The main line switch is now thrown on, the clock set, and the cord placed in the patients hand with instructions to pull same if there is the slightest localized discomfort or burning. The current is very gradually turned on to test the machine, cords and electrodes, usually up to two thousand milliamperes. The current is gradually increased to five or six thousand milliamperes if possible. There must be no other sensation than heat. A machine that will deliver separate and different amperages to chest and abdomen is to be preferred, that is to say, a double stream flowing to the large electrode on the back.

### PREPARATION OF THE PATIENT

There are certain necessary preparations to be made before the treatment. It is absolutely essential in my opinion that the bowels be evacuated before the treatment is given, and an enema employed, consisting of plain warm or hot water. The breakfast should be limited to fluids or semi solids. If there is nausea an alkali should be given just before the treatment and repeated, if necessary, during the treatment. Some patients complain of headache, (head "fullness" or constriction) shortness of breath, of palpitation, of thirst, or of a sensation of numbness of hands and feet. If the patient becomes nervous and restless sedatives should be given both before and during the treatment. Water, tea, lemonade, orangeade need not be absolutely restricted but it must be hot, and

may be taken even if nausea and vomiting result. If these symptoms should occur, an ice cap may be used or the face sponged or a small (four inch) electric fan used to face only. The patient should rest a good deal the day of the treatment and retire early if ambulant. It is sometimes very useful to give the patient a hypnotic the night before the treatment unless they are good sleepers.

#### DURATION OF TREATMENT

There is no fixed duration of treatment. This ranges from three to six to eight or even ten hours, depending on the disease, the reactions of the patient and the results obtained. The great advantage of the use of electrical energy lies in the fact that the treatment is absolutely under control, and can so to speak, be standardized to each and every patient, a feature not possessed by any biological method. Duration of treatment is based upon the immediate reactions of the patient during the treatment, the immediate after effects and later (12 hours) effects. Upon these, the clinician must base his duration, dosage and frequency of the treatments.

#### AFTER TREATMENT OF THE PATIENT

After temperature is elevated to the desired height, the patient is wrapped in blankets and transferred to another bed and covered with a special heating pad or hood. In this way temperature can be maintained, raised or lowered by turning the current off from the heating blanket or in the hood. At the end of the period of treatment, the patient is permitted to cool off gradually, and is given finally an alcohol, and then a talcum powder rub. He is now permitted to receive cool or cold fluids in abundance and partake of a light meal, but must rest for some time.

#### DISADVANTAGES OF THE TREATMENT

In spite of the many advantages of this method, its lack of danger, no fatalities, absolute control and its excellent results in the most hopeless of diseases, it possesses certain disadvantages. These may be enumerated. It is a strictly hospital method. I have tried it repeatedly on "out" patients and never with the same results as where the patient is hospitalized. It is a treatment of continuous hard work and requires the constant presence and unremitting care of a nurse, well trained in its use. The patient should never be left for a moment while the current is running. The nurse should be able to summon a physician at any time and one thoroughly familiar with the treatment. It must be scientifically applied and temperature, pulse and respiration recorded every fifteen (15) minutes. Frequent tests of blood pressure must be made and all of these must be recorded. Each treatment and its record must be studied by the physician be-

fore another treatment is given. One must never forget the danger of burns. We have so far (after 18 months) never burnt a patient save a tiny place no larger than a pea and this we attribute to unremitting attention.

#### ADVANTAGES OF PYRETOTHERAPY

Pyretotherapy possesses many advantages over the use of bacterial and biologic preparations, especially the use of the malarial parasite which is of little value save in paresis. The fever produced is similar both to the fever of disease and that of malaria, except the chills. Its range is much wider, is increasing with experience, and in my humble judgment will continue to be beneficial in diseases that at present are not considered amenable to its effects. One recent case of Adiposis Dolorosa (Dercum's Disease) is but an example, so that we may say that there is reason to believe that this form of treatment will be proved useful in many diseases in which it has as yet been untried. In the following list we enumerate the chief advantages of this form of pyretotherapy.

- (1) It is always available.
- (2) No pathogenic organism of unknown effect is injected into the patient; therefore there is no disturbance of the immune reactions nor depletion of complement of the blood.
- (3) The frequency, duration and intensity of the temperature or febrile rise or paroxysm is under accurate control.
- (4) The desired elevation for that particular case can be produced at will and maintained as long as desired.
- (5) Since the intensity, duration and frequency of the fever can be accurately controlled, the reaction or response produced in any particular patient can be more nearly standardized, and repeated indefinitely if necessary.
- (6) We thus learn the most favorable temperature curve for each patient.
- (7) Normal metabolic activity of the body is stimulated.
- (8) Clinical and laboratory research may be conducted on the effects of fever *per se* in many conditions.

#### THE PHYSIOLOGICAL ACTION OF PYRETOTHERAPY

If we look upon the human body as an energy-producing and energy-dissipating mechanism we must realize that its balance is maintained by a metabolic activity, so balanced as to maintain its body temperature within a moderate range of what we are pleased to term the "Normal" although this may vary. The object of pyretotherapy is to generate electrically in the body, heat from an outside source of energy and at the same



time prevent the loss or radiation of this heat energy. It stands to reason that if the energy is sufficient, the general heat of the body will rise, due to heat retention the gain in energy being greater than the loss. In the passage of high frequency currents of great volume through the body we generate heat and (by coverings and etc.) we insulate the patient against the loss of heat, the resultant accumulation of heat causing a rise of temperature, in other words fever. It is heat generation, with a prevention of heat loss. This being the *modus operandi* of the production of fever by high frequency currents it may be of interest to record briefly my study of the action of artificial fever upon the organs and functions of the human body *ad seriatum*. We will therefore consider its effects as follows:

- (1) Upon Temperature.
- (2) Upon the Cardio-Vascular System.
- (3) Upon Respiration.
- (4) Upon Metabolism.
- (5) Upon the Muscular System.
- (6) Upon the Skin.
- (7) Upon the Blood.
- (8) Gastro Intestinal System.
- (9) Genito Urinary System.
- (10) Upon the Nervous System.

#### THE EFFECT OF PYRETOTHERAPY UPON TEMPERATURE

As we have heretofore stated, the body temperature rises because of the increased generation of heat within the tissues of the human body by the passage of the High Frequency current and because the mechanism of heat loss is interfered with through the prevention of heat radiation from the skin's surface. Of course, there is a certain amount of heat loss brought about through respiration, perspiration and excretory loss (urine) but this is small in comparison with the heat generated and retained in the body as a result of which the temperature rises. At first, this is accompanied by a very pleasant glow, or sense of increased heat until the temperature begins to ascend. It has been my experience that patients responding in what might be termed a normal manner usually require twenty to thirty minutes before the temperature increases one degree. An ideal rise of temperature in my opinion would be that of one degree Fahrenheit every 15 minutes until an oral temperature of 104-105° F. is reached. Due to the fact that there will be, as a rule, profuse perspiration and some heat loss, we must have a source of energy supply of sufficient size and capacity to overcome any loss and superheat the tissues. The patients, as a rule, that can stand the above outlined rise of temperature require no preparation other than that of

which we have spoken. On the other hand there will be cases who suffer discomfort, become more or less nervous and this condition will have to be met by sedatives. In ordinary cases, sedatives of barbitol group, will be found sufficient and of this group, we prefer luminal, amytol sodium and pentobarbital. It may be necessary, however, in paresis to employ not only a moderate dose of phenol-barbital, amytol Sodium or Nembutal, but a hypodermic of at least one quarter of a grain of morphine. We much prefer to avoid the use of drugs. Excessive perspiration may call for a minute dose of atropin. When we speak of a sufficient supply of energy to superheat and produce fever we refer to currents ranging between five and six thousand milliamperes. That this energy is the cause of the fever becomes at once apparent when the source of energy is cut off.

Those species having a highly developed nervous system, possess thermo-regulating apparatus. In the basilar centers of the brain this delicate mechanism maintains a wide spread mechanism for both the prevention and loss of heat. Barbour has demonstrated that warming of the corpus striatum reduces rectal temperature, while chilling of the same region produces an opposite effect. Except respiration all the factors conceived in the regulation of heat in mammalia are under the direct control of the central nervous system (Cramer).

As I have repeatedly stated, and as is maintained by de Kraft, Titus, et al, the heating occurring from the oscillatory effects of the high frequency current occurs throughout the interior of the body, that is from within out, instead of from without in, as is the case in convective heating. It stands to reason as heating in this treatment varies somewhat according to tissue density, hence we get some variation, but the activity of the circulation leaves it an undetermined question at the present time. Pyretotherapy (electrical) however does resemble the fever of infections as it is produced from sources within the body. The explanation of the action of an infection is that of a provocative poison reaching the tissues and initiating catabolic changes which increase the affinity of the tissue for water. This general demand upon the blood for water tends to reduce the blood volume especially at the expense of the surface blood. The skin immediately becomes cooler and this arouses the nervous regulation against cold, thus exaggerating the process of vaso constriction and hemo concentration. (Barbour). By careful attention to the prevention of radiation, the higher temperatures of 104-105 or 106 ° F. *per oram*, can be maintained even after the

machine has been turned off. Where it is necessary to use the machine on a number of cases, a febrile temperature can be maintained for a long time by the use of ordinary large electric blankets. Persistence or continued maintenance of temperature, procured by heat from carbon filament lamps. A possible explanation for the maintenance of elevated systemic temperatures may be the occurrence of blood concentration during the period of temperature elevation. Care should be taken not to give the patient cold water to drink or to use any other means of heat dissipation during the period that the temperature elevation is desired. If the patient feels weak or faint-like, it is an excellent thing to rapidly sponge the face with a cool rag and for a few seconds, permit a very small electric fan to blow upon the face. It must be borne in mind that the elevation of temperature and its accompanying physiological activities is the *sine qua non* of the treatment. The great advantage of electrically produced hyperpyrexia is that it produces hyperpyrexia alone and does not add any complicating factors to the problem of temperature elevation.

#### THE EFFECT OF PYRETOTHERAPY UPON THE CARDIO-VASCULAR SYSTEM

As the patient begins to become heated and the temperature begins to rise, there is a rise in the rapidity of the pulse and a change in its quality. With the rise in temperature and with the efforts of the system to throw off the heat, the skin becomes engorged and in a short time depending upon the sensitiveness and normal activity of the skin, perspiration breaks forth in variable amount but usually quite profuse. The pulse becomes smaller, and softer and its tension is lowered. The heart sounds become less loud, as a result of the dilatation of the vast capillary and vascular system of the skin, there is naturally a lessening of the quantity of blood passing through the internal organs. This is shown in a number of ways of which we will have occasion to speak later along. The rapidity of the pulse increases as the temperature rises, and for this reason, care and caution should be exercised at the start of pyretotherapy in a case that already has a rapid pulse. We have learned that one should use pyretotherapy with extreme care if at all in a case of well marked hyperthyroidism or exophthalmic goitre. It is not unusual for the pulse to rise to 120, and as long as it does not exceed this figure we consider it a normal response. We have records of a number of treatments in which the pulse rose to 128-134, with most excellent results from the treatment. Davies & Holmes ascribe this rise to stimulation of the

sino-auricular node.

Bierman states that there is approximately a rise of 1.4 to 30.6 beats per minute for each rise of 1°C (2.65°F) and that the velocity of the blood flow is increased. It should be cautiously used in any case of very low blood pressure, organic valvular heart disease and severe myocarditis. We have noted variability in the blood pressure which we shall consider in a subsequent communication although there is usually a slight systolic rise, a diastolic fall and later a systolic fall.

#### THE EFFECT OF PYRETOTHERAPY UPON THE RESPIRATION

In the average case, with a respiration of, say, 18 per minute a rise does not take place as a rule until 45 minutes after the commencement of the treatment. As the temperature rises we may expect the respiration to increase but so long as it does not ascend too rapidly nor does it exceed 24 to 26 per minute, it may be considered a normal rise. Any increase above 26 per minute demands a medical decision as to the continuance of the treatment. The respirations become as a rule shallower but we have not noticed that it tends to produce irregularity and variability in the respirations themselves but rather the change is simply a quantitative one. There are times when the respiration does not exceed 24 per minute that the patient complains of shortness of breath, air hunger and difficulty in getting a full deep breath. Under such circumstances almost immediate relief can be obtained from the administration of one half to one dram of aromatic spirits of ammonia, to which seven drams of ice water have been added. In our experience this increase averaged one to seven excursions per minute for each degree centigrade (2.65°F). According to Bozett with the rapid rise in temperature hyperpnoea develops. The tidal wave is increased to two liters. This increased respiration is accompanied by definite sensations of air hunger. Haldane has shown that hyperpnoea caused a marked fall in alveolar CO<sub>2</sub> tension.

It may be noted here that certain variations in temperature, pulse and respiration can be used as a guide to the safety of the administration or continued use of the treatment. For example, if the temperature has risen, say, to 104 or 105° F., and the pulse has risen to 124 or even to 132, if the respiration remains at 20 or 22, the treatment can be continued. *Vice versa*, if the pulse remains down and the respiration rises, we feel satisfied to continue the treatment but when temperature is high and both pulse and respiration rise, then the treatment must be dis-



continued immediately, cold applications made to the face and neck, a small fan turned upon the face, an ice bag applied over the heart and a physician summoned at once. It is of course understood that as soon as this tripod of symptoms of high temperature, high pulse and increased respiration occur, the machine should be immediately shut off and the above mentioned measures pursued. We have found that watchfulness can in many instances prevent this occurrence.

#### THE EFFECT OF PYRETOTHERAPY UPON METABOLISM

There are still many divergent views upon the changes of metabolism that take place in fever. Variations in temperature have been demonstrated to affect the velocities at which many bodily functions are performed. We therefore have to consider the intensity of the combustion which is produced by the generation of heat, whether this be biochemical or physical and at the same time the prevention of radiation or the loss of heat. Many years ago, Leyden and Liebermeister showed that there was an increased combustion in fever by the production of carbonic acid, while recent American studies have shown that in infection accompanied by fever, the height of the metabolism is the function of body temperature. Fever influences chemical reaction. DuBois called attention to the fact that heat is increased due to an actual rise of the temperature of the tissues and the consequent greater velocity of their chemical changes. This is especially true of the fever produced by high frequency currents as the rise takes place within the tissues themselves. When the regulatory apparatus against over-heating, (fever) fails or is interfered with, the body temperature rises as a result of an increased metabolism. This rise is further favored by the concentration of the blood which takes place through the loss of fluid from the body, especially the skin. Recently Knudson and Schaible have found that in pyretotherapy there was a decrease in the volume and bodily weight return to normal in 24 hours. Protein metabolism is influenced by a number of factors such as undernourishment, the rapid absorption of glycogen, increase in temperature and injuries of the chemical regulation of heat. Temperature rises under the toxic influences of the proteins of the body cells and the resorption of inflammatory material associated with infections and suppuration. It has been found that at lower temperatures, there is a tendency toward a condition of alkalosis but where the temperature is high, the reverse tendency is present and acidosis makes its appearance believed largely to be due to the production of lactic acid. I have noted in some cases that with the rise of temperature

to a maximal point, that nausea and a tendency to vomiting occurred are not uncommon symptoms in acidosis and that this could be relieved by the administration during the treatment of alkalis. The presence of the lactic acid is probably due to the greatly increased metabolism and the lack of aeration of the blood. We have observed that the nausea that has been mentioned above has at times been accompanied by air hunger. The protein metabolism produced by fever according to Grafe shows qualitative changes accompanied by the entrance of albumoses and diazobodies into the blood, which, according to this author, have a different composition in the different types of infectious disease. The amount of these substances is small and do not generally come into consideration as opposed to the other protein products. There can in fever be a decomposition of fats whereby small quantities of acetone are formed. He believes that this is not directly the result of the fever in adults, for he has observed that on a suitable diet this condition is never seen. We have noted an increase of thyro-toxicosis in those who have an increased basal metabolic rate, and for this reason and two disagreeable experiences, we feel that a primary knowledge of the basal metabolic rate is absolutely necessary in every case. Each case must be carefully studied and never treated until its metabolic rate is determined.

#### EFFECT OF PYRETOTHERAPY UPON THE MUSCULAR SYSTEM

As a rule with the increased generation of heat within the body, there is at first a sense of comfort and relaxation over the entire muscular system of the body. The muscles tend to relax. After a time the patient may have a feeling of restlessness and this can sometimes be relieved by a cautious shift of position. In some patients, muscular restlessness is evinced when the temperature reaches a high mark. In such cases, likewise, the administration of a sedative will be found most advantageous. It can be readily understood that it is one of the essential factors in the treatment that muscularly the patient must be as nearly as possible at absolute rest. Where this is obtained higher temperatures can be administered without the risk of a burn that might be brought about by restlessness and muscular activity. This should be especially borne in mind with regard to the hips and lower limbs any movement of which may displace the lower part of the abdominal electrode and produce a burn. Muscular relaxation and comfort can be aided by the use of a prop somewhat resembling a carpenter's "horse" which elevates and supports the blankets above the feet. This little attention to technic will often

times make the difference between a restless and a quiet patient. The restlessness that is sometimes present is not due to the action of the fever upon the muscles but to its influence upon the blood. The muscular tissue both skeletal and of the organs is dehydrated, to such an extent that several pounds of weight may be lost at a treatment. With the cessation of perspiration the free ingestion of water, especially alkaline waters, restoration of water to the tissue takes place and in 18 to 24 hours the loss is compensated.

#### THE EFFECT OF PYRETOTHERAPY UPON THE SKIN

One of the first effects of Pyretotherapy upon this skin is to flood this very vascular organ with blood. This gradually increases, accompanied by the sensation of warmth and marked dilatation of the capillaries. The skin becomes warm to the touch, pinkish in color, and after several treatments becomes softer and smoother. Patients whose skins are dry and who perspire with difficulty, soon notice the difference in their skins and frequently comment on the change. As the temperature rises, the skin begins to perspire, an attempt of the body to radiate heat. As we have heretofore remarked, it is essential to have sufficient power to steadily raise the temperature, while at the same time preventing heat radiation. Unless this is attained, the heat regulating activity of the body will attempt, through the perspiration, and by evaporation, to bring about a rapid elimination of heat. It thus becomes apparent that the perspiration is an essential factor to be considered in the success of this method. Perspiration may take place even before there is an elevation of either the oral or rectal temperature. During the treatment, there is an excessive amount of perspiration. We have found patients to lose as much as four pounds in weight and Bierman has noted a loss of five pounds as the result of a single treatment, which loss of weight is mainly to be accounted for by the water loss. As the fluid lost in perspiration comes from the blood, and the more succulent tissues, such as the muscles, subcutaneous tissue and the gastrointestinal tract, we expect a general dehydration of these tissues and a somewhat marked concentration of the blood. Hurdack has noted recently that the permeability of the lymphatic capillaries is increased when the temperature of the part is raised. I have noted a number of vasomotor changes as a result of pyretotherapy. As all are aware the vascular system is under the control of the vaso-motor nerves so that when warmth or increased heat is applied to any part of the skin surface, the vasomotor response is that of dilatation with increased pinkness or red-

ness of the skin. The opposite of vasoconstriction follows the application of cold. With the increased pulsation of the heart, there is an increased arterial and capillary pulsation. Bierman states that Amitin has demonstrated an increased volume in the parts warmed and that in addition to the direct action of the heart, a nerve and chemical mechanism is involved. After nerve section in man, there was noted a marked redness and increased surface temperature in the affected area during the first few days, though Lewis and his co-workers have advanced the hypothesis that the reddening of the skin may be initiated by some substances of the histamine type, since if the circulation be temporarily arrested and later released, a delayed heat hyperemia may be seen in a limb that has in the mean time been cooled, and Goldschmidt and Light have shown that the venosity of blood returning from a limb depends upon the balance between the metabolism and the rate of the blood flow, both of which are increased by a rise in temperature. At high temperature the circulation rate had increased so greatly that the venous blood contained large amounts of oxygen, even though the metabolism was undoubtedly much increased. Landis has shown in man that the capillary pressure is definitely raised to a considerable degree. Thus while in the skin of the finger he obtained under normal room conditions a pressure of about 32 mm. Hg. in the arterioles of the limb and capillary loops and about 12 mm. in the venous limb, he found these values raised to 60 mm. and 45 mm. respectively when the skin temperature was raised to about 42°C. (107.6°F.). Since the osmotic pressure of the plasma proteins in man is about 26 mm. this implied a filtration pressure of edema formation, equal to the difference of some 25 to 30 mm. of Hg. Presumably this fluid would drain away through lymphatics under normal conditions.

Clinically, I have observed a flushed face for several hours after the temperature was normal and in one case this was hemifacial and especially marked in the right ear. In my opinion there is a tendency to greater vasomotor activity and better regulation as has been noted by the increased warmth and better circulation in the hands and feet of patients who have complained of cold extremities for many months. In several instances localized warmth has been maintained for a number of hours; in one case felt markedly in the abdomen, in another in the lumbosacral regions and in a third in the joints of the lower extremities.

One patient especially mentioned an increased susceptibility to heat and perspiration, so much so that while formerly she used



to "hug" the radiator, she found a normal temperature in the room more than sufficient for comfort.

#### THE EFFECT OF PYRETOTHERAPY UPON THE BLOOD

Changes in the blood do not take place at once but only after the temperature has been raised for at least three quarters of an hour. Owing to the profuse perspiration there is a considerable loss of the watery constituents followed by a marked concentration. The use of large quantities of fluid during the treatment usually does not affect the concentration to a great extent but as a rule increases the output of the perspiration. My experience has been that patients do not demand much fluid during the period of the treatment but afterwards consume quite a quantity, evidently in this way making up for the loss of water from the blood. Many years ago, Liebermeister wrote of the febrile reaction of the body against infection, which in its genesis and course must be regarded as a protective mechanism claiming that there is an increase of chemical reaction which is accelerated with every increase in temperature. Rolly and Metzger have shown that in temperature: up to 41° C. phagocytosis is increased in activity and that agglutins, antibodies and bacteriocidal substances are more rapidly produced. We have noted an increase in the red blood cells, probably resulting from a concentration of the blood. Freund says that there is an increase in the blood sugar content in fever, but this is of such a degree as may well be accounted for by blood concentration, and upon a similar basis increase of non-protein nitrogen and blood chlorides has been observed. With the lower temperatures, we find that there is a tendency to alkalosis but with high temperatures, there is an acidosis caused by an increase in the production of lactic and carbonic acids. Furthermore they found that the non protein nitrogen of the blood is generally increased, sometimes over 200 per cent while urea nitrogen, creatinin and amino-acid nitrogen are also increased as a result of the increased metabolism resulting from the rise in temperature and the oliguria.

In the use of hyperpyrexia by electrical means, it must be remembered that we have one notable advantage in our studies and experiments in that no foreign substance is introduced into the blood and hence biologic reactions do not occur as is the case with foreign proteins, etc. In fact, complement is not affected.

#### THE EFFECT OF PYRETOTHERAPY UPON THE GASTRO-INTESTINAL TRACT

The effect of this treatment is shown clinically in quite a number of ways. The saliva has a tendency to thicken and the patient will frequently complain of the mouth becoming dry and that the tongue feels parched. Observation will show that there is a lessened normal moisture and that the tongue appears redder than before the treatment. In the few examinations we have made by the fractional method of gastric analysis, we have noted a diminution in the gastric secretion as a whole with lessened or absent free hydrochloric acid. There is also a lessened secretion from the gall bladder and where biliary drainage is used by the Lyon-Meltzer method the bile is as a rule slower to start, is quicker and darker than normal. We can readily recognize a lessened activity in the intestino-colonic tract by the tendency to constipation that frequently occurs in cases under treatment and which must be carefully combated. Patients have called attention to the fact that their stools were oftentimes lighter in color which would seem to indicate a lessened activity on the part of the gall bladder, with lessened secretion and excretion of the bile itself. We have further noted that patients do not, as a rule, have any desire for stool while they are taking the treatment. This we believe to be largely due to the sedative effect of the current and the heat upon the muscular fibres of the gut. There is also possibly here a more or less diminished neural activity. We have not noticed any indication by inspection or through odor, of putrescence in the bowel movements.

#### THE EFFECT OF PYRETOTHERAPY UPON THE GENITO-URINARY TRACTS

This treatment has a decided effect upon the urinary tract. Care should be taken to empty the urinary viscus just before treatment. The first noticeable thing is that the urine becomes scanty and high colored. Some times it is of a very "strong" odor. There is nothing specifically noticeable about this odor. The lessened quantity of urine results in a much higher specific gravity, and increase in urea and sometimes indican, urobilin, etc. I have noted that the urine is lessened in amount of from three to five hours after treatment. Even the ingestion of large amounts of fluid during the treatment does not seem to induce renal activity but as mentioned before, increases the perspiration. The oliguria, especially in summer, is oftentimes accompanied by the presence of a large number of crystals of oxalate of calcium and uric acid, doubtless the result of the concentration. The probabilities are that the oliguria maintained for a number of

hours after cessation of the treatment, is due to the fact that there is a re-absorption of water by the solter structures, that is to say, the muscles, subcutaneous tissue, gastrointestinal tract take up the ingested water before the blood becomes sufficiently rediluted. In other words, there must be a tissue satisfaction before an active urinary flow is to be expected. I have noticed that a urine that contained a trace of albumin, a few hyalin and small granular casts, with low specific gravity, (sclerotic kidney) has cleared up after a number of treatments. I believe there is a distinct advantage in the use of an alkaline water after the treatment.

#### THE EFFECT OF PYRETOTHERAPY UPON THE CENTRAL NERVOUS SYSTEM

A number of patients are somewhat nervous in taking their first treatment. It is therefore necessary for the physician and the nurse in charge to reassure and comfort the patient so that he enters in a frame of mind conducive to quiet and restfulness. A tactful nurse who explains and instructs her patients is a necessary factor. At the start of the first treatment the physician should be present. There are some patients that no matter what may be said or done require mild or moderately strong sedation. The first effect of the treatment is agreeable. There is a warmth and relaxation, both physical and nervous. Some patients become drowsy and doze fitfully between the periods of taking the temperature. At the end of approximately 45 to 60 minutes, when the temperature should have risen to between 102-103° F. the patient is apt to experience a certain amount of restlessness, in my opinion the result of the elevation of the temperature *per se*. A dull heavy frontal headache may occur. Care should be taken to eliminate any extraneous source of irritation, such as the pressure of the blankets upon the feet, an uncomfortable strain upon the knee joints, the disagreeable tickling of the blanket around the throat, and external irritants, such as the shining of light, directly upon the patient's face and eyes. The patient may complain of sensations of internal heat in the abdomen and chest, but a little reassurance will as a rule overcome this but where there is actual physical restlessness the nurse must be extremely watchful for fear that the patient will displace an electrode and cause a burn. It has been my experience that the irritability may also extend to the psychic sphere and patients become what our Gallic friend calls "difficult." It will be seen that there is a wide scope for study along this line. I have not noticed any immediate effect upon the pupils or reflexes, that is to say any changes that could be laid to single or multiple treatments by this measure.

#### PERSONAL OBSERVATIONS

In a careful study of quite a number of treatments, I have noted that a rapid rise in temperature without a rapid rise in pulse rate is a favorable sign. What do I consider to be the ideal rapid rise of temperature in a case. I should say, one degree F. every 15 minutes after the first quarter of an hour, until 103-104° F. is reached. It will be observed that patients that start with subnormal temperatures very shortly have a maturnal temperature of normal, and no longer suffer from chilliness in the early morning. Most patients during the first two or three treatment are somewhat resistive to the rapid or proper rise of temperature. This takes place at the commencement of treatment but very soon they are able to stand higher milliamperage and more quickly respond to the thermic effect. I call this "acclimatization." Patients become after a time as it were acclimated to the treatment and then respond readily and with quick rises of temperature even to 104° F. within one hour. Sometimes it will be found that after a patient has become acclimated, is reacting nicely and progressing well, that for some reason not altogether clear, he does not heat up readily and his temperature refuses to rise as it should and usually does. I can offer no explanation for this clinical observation. It is an interesting fact, that the final temperature will be found occasionally to fall lower than the initial temperature and be subnormal. I have observed that patients become more easily acclimated in summer than in winter.

Even if the pulse rises to 100 or 120 there is no danger so long as the respiration remains not over 26 per minute. The reverse is true, that if respiration increases and pulse rate does not rise, there is no danger, but a simultaneous rise of pulse, temperature and respiration demands the physician and an immediate decision as to the course to pursue. It has always seemed a good sign when the respiration drops to normal within a few minutes after the power from the machine has been turned off. If the respiration immediately falls when the heating process is checked by shutting off the current, we may expect an excellent reaction (cessation of pain, feeling of well being, lessened nervousness, etc.) to follow.

When the patient suffers from difficulty in breathing and experiences air hunger, and the respiration drops, stop treatment immediately, apply cold over the heart, and to the forehead, and give aromatic spirits of ammonia and allow the patient to rest for some time.

There are times when all factors are maintained steadily (machine, coverings, sur-



roundings) the temperature may suddenly rise, which I believe to be due to an unusual retention of heat in the patient's body. People who never sweat, soon have active skins. Raintness, especially in hot weather, is best relieved by one dram of aromatic spirits of ammonia in seven drams of cold water, and a very small fan (4 inch) to cool the face for a moment or two. One should always note the clinical condition and well being of the patient in connection with the physical manifestations of temperature, pulse, respiration, and blood pressure. Constipation must be avoided. One patient collapsed temporarily, was relieved at once by a hot enema and was able to resume the treatment. If patients are toxic, post-treatment reactions appear. Arthritics have pains and stiffness greatly increased at first. I have never noted any increase in Tabetic pains. One should be very careful and watchful in the use of this measure in hyperthyroid cases with marked tremor, rapid pulse and extreme nervousness. Patients often make the greatest gains between courses of treatment.

#### DISEASES BENEFITTED BY PYRETOTHERAPY

The following cases, with the exception of chorea, psoriasis and optic atrophy have in my hands received benefit from the treatment. I have treated no cases of the three above mentioned diseases.

Multiple Sclerosis

Locomotor Ataxia or Tabes

Pseudo-Tabes (Luetic Meningitis)

Radiculitis and Poly-Radiculitis

Parkinson's Disease. (Shaking Palsy)

Post-Encephalitic Parkinsonian Syndrome

Arthritis, both infective and gonorrheal

Arterial Sclerosis and High Blood Pressure

Severe Liver and Gall Bladder Infections

Adiposis Dolorosa (Dercum's Disease)

Asthma (Intractible)

Chorea

Raynauds Disease

Thrombo-Angiitis Obliterans

Paresis

Cerebro-Spinal Syphilis

Psoriasis

Optic Atrophy

In the treatment of a number of the diseases, I have enumerated, above, a maximal temperature that can be developed or withstood is not necessarily the optimal one. Each case must be studied, each treatment checked and the temperature standardized, so to speak, to each patient. In arthritis of all kinds, long treatments are essential; this I have learned. Severe conditions of cardiac and vascular weakness do not of necessity preclude its use. Sometimes even two or three degrees rise with special localized treatments, will give relief and as the pa-

tient improves and becomes acclimated, we can cautiously increase the temperature. Organically diseased and handicapped patients can not expect to respond to this treatment as would the less seriously afflicted. Again remember that fever is a defense reaction and of great value, where it is under complete control. In my humble judgment, its field will widen and widen. We can in electrical pyretotherapy change the temperature at will. In some diseases (gonorrhea and syphilis) we need temperatures lethal to the bacteria. In others milder and lower temperature aiming more at slight febrile conditions will prove effective. The combination of a moderate febrile rise with a high local temperature may eliminate diseased states that have resisted every other kind of therapy.

Science moves ever upward and onward.

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#### Stimulation of Gastric Pepsin by Histamine.—

Pollard presents evidence to show that, in human subjects, histamine stimulates secretion of gastric pepsin. The character of the pepsin curve and the similarity of the response after the second and third injections of histamine can be interpreted satisfactorily only by assuming that histamine stimulates the peptic cells. The effect after the first stimulus is probably best explained by a mechanical lavaging of pepsin which has accumulated in the furrows and tubules of the gastric mucosa plus an actual stimulating effect by the histamine. Therefore it appears that, in studying gastric secretion in human subjects, histamine is suitable for determining the capabilities of the pepsin-secreting glands as well as the acid-secreting glands. Although the two processes are independent, they are influenced by the same stimulus.

## TUBAL TWIN PREGNANCY\*

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Because ectopic pregnancy is always interesting and tubal twin pregnancy comparatively rare, the following case is presented:

Mrs. E. K., a multipara, age 35,—last baby 10 years ago, has been regular with her menstruation since that time. Last regular menstruation was from May 4th to May 9th, 1932. On June 10th she had a slight bloody discharge which has appeared at various times since. On July 15th she complained of severe abdominal pains most marked in the upper right quadrant.

In a few days the patient was up and around until July 28th, when she had another attack of acute pain and upon vaginal examination a mass was felt on right side;



a diagnosis of ectopic was made and operation advised.

She entered Speer's Hospital, at which time the blood count showed 80% hemoglobin and 3,000,000 reds.

The patient was operated on July 29th. Upon opening the abdomen large quantities of free blood and blood clots were seen and removed, blood coming from a tear in the right tube. Right tube the size of a large orange was removed and upon being opened the twin pregnancy was discovered.

Patient made good recovery and went home at the end of two weeks.

## MALNUTRITION, AN IMPROVED METHOD OF TREATMENT\*

FRANK M. STITES, M. D.

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Louisville.

Since the early work with Insulin, following Banting's discovery in 1921 much has been said about the fattening effect of Insulin in diabetic patients, but until more recently little has been known of the beneficial effects to be obtained from Insulin in non-diabetic individuals with lowered metabolism. Volumes have been written about Insulin and the management of the diabetic but in this article there is no study made of the individual with pancreatic deficiency as manifested by increased blood sugar or inability to handle a high carbohydrate diet.

Joslin in his book mentioned overweight as a result of Insulin and suggested a possible danger of Insulin to which Allen had previously called attention. He further states that "One very noticeable early effect of Insulin treatment is a filling out of the face which may become noticeable in a day or two after the first doses of Insulin. This fullness persists and the skin becomes noticeably clear." The patients tend to readily become obese and Joslin was of the opinion that the gain of weight resembled the so-called dystrophic adiposo-genitalis.

Our study of 30 patients who were markedly below normal with no demonstrable organic lesion and who had showed little or no improvement under other forms of treatment constitute a group handled by us since April, 1931. This work was first called to our attention by Dr. Llewellyn Barker, who saw a patient of mine in April, 1931 and at his suggestion we evolved the routine which is given. Since that date it has been found a most satisfactory method of handling a previously unsatisfactory group of patients.

Several articles have appeared in recent literature, notably by Roy D. Metz, of Detroit in Journal of A. M. A. May 2nd, 1931 and in the American Journal of Medical Sciences of May, 1932 by Dr. Louis Nahon and Dr. H. E. Himwich. Both of these deal entirely with the use of Insulin as a method of treating malnutrition but we are giving a somewhat more elaborate and more rapid method of accomplishing the same results.

Various methods of feeding and of Insulin administration are suggested but we find the simplest method is to follow the usual three meal plan and administer the Insulin in one dose, prior to the principal meal. Some advocate frequent small doses of three units

\*Read before the Campbell-Kenton Medical Society.

\*Read before the LaRue County Medical Meeting, Hodgenville, August 25, 1932.



prior to each feeding, increasing food and insulin as improvement occurs. This of course has many objections for the average case but possibly in a few selected cases has its advantages. Others continue the three meal feedings and begin with small doses of Insulin prior to each feeding, increasing as under the previous plan. Personally the single dose of Insulin seems the most practical in the majority of cases and it is much easier to secure proper co-operation under such a plan.

Our usual procedure in the cases that are to be reported is as follows: (1) put the patient to bed with absolute rest. The bed is to be elevated about 4 inches at the foot to overcome any existing ptosis. (2) Order a full and well balanced diet consisting of three meals daily, supplemented by a glass of milk and cream with one raw egg after each meal. The diet should contain an abundance of fresh green vegetables and a high carbohydrate content. (3) Insulin before the principal meal of a 10 unit dose. (4) The following or a similar bitter tonic before each meal seems to stimulate an appetite.

Rx Tr. Nux Vom.

Tr. Gentian Comp. aa. oz. I

M. Sig: Fifteen drops in water before meals.

(5) After each meal a teaspoonful of Iridol with Malt is taken and frequently if there is an anaemia some easily assimilable form of Iron is given.

The following cases are interesting and outline the course more clearly than any other method.

Case 1. Mrs. J. R. W.—A widow, age 52, had been in poor health for many years and shown no improvement under any treatment. Her maximum weight 5 years previously was 125 pounds and in April, 1931 weight was 119 pounds and height 70 inches. She was put to bed for two weeks and followed the above routine under a nurse's guidance. There was a prompt and rapid response and a gain of 14 pounds in as many days. The Insulin and bed rest were discontinued but the other treatment continued for one month longer. Since then there has been no treatment and today the patient is entirely well and free of all symptoms, weighing 165 pounds.

Case 2. Mrs. R. W.—age 47, had been under medical treatment most of life, has had frequent periods of prolonged rest, tonics and had never shown any appreciable improvement. At one time she was supposed to have had some pulmonary tuberculosis but when seen by us this was an apparently cured condition. Patient was 64 inches tall and weight was 98 pounds. She was put to bed on our usual routine with 10 units of

Insulin daily and after 10 days had shown an increase of 10 pounds. One year later she is weighing 132 pounds and is able to attend to her household duties and has no symptoms as formerly. This case was rather classical in that she was unable to accommodate a normal diet until after several days of treatment but before one week had passed there was a normal appetite, the stomach capacity was increased and even hunger appeared before she was allowed out of bed.

Another patient, E. A.—a school teacher, age 28 who was never robust returned to her home this summer and following the routine that we suggested under the care of her home physician, has increased her weight from 98 pounds to 112 pounds in two weeks time. This period was followed by a strenuous trip to Colorado Springs and when seen two weeks ago she had retained the weight and was feeling normal.

Case 4. Miss D. S.—age 20, height 62½ inches had never weighed over 95 pounds. When first seen she weighed 91 pounds and was advised to take 10 days rest with treatment. At the end of that period her weight increased to 98 pounds and she is continuing to gain, at present weighing 100 pounds after six weeks observation.

Case 5. Mr. C. E. M.—age 55, height 68 3/4 inches had never weighed more than 118 pounds. He was able to secure life insurance but was usually rated because of his weight. After his wife had shown a marked improvement he voluntarily followed the same routine without the rest in bed. At the beginning of treatment he weighed 116 pounds. One month later he had gained to 134 pounds and at present is holding his weight with no medication.

We could quote many other cases whose ages range from 20 to 60 years and all but two have shown permanent improvement. These two cases have not held their weight but both have shown other pathology that has been a definite factor in the loss of weight.

We hope that this article with its case reports will help others in carrying out this work among a group of patients who become the most satisfactory because they have been semi-invalids for many years and normal health to them is a previously unknown condition.

Our foreign literature has been full of this since Falta in Germany did his first work in 1925 but in this country we have looked upon Insulin as associated altogether with diabetes.

We realize now that as an aid in overcoming malnutrition Insulin has passed the experimental stage and this as a treatment is al-

ready an approved method and marks a great addition to the study of the always puzzling endocrine system. Its use is advocated for many other conditions such as subfebrile and afebrile T. B., peptic ulcer, colitis, gastric atony, menorrhagia, nervousness and even the psychotic patient.

These claims are undoubtedly due to an overenthusiasm for a new treatment but probably deserve some merit and careful observation will in time determine the most useful field for this treatment.

Naturally much speculation has existed as to the method of action and the following probably summarizes the most likely possibilities.

(1) Insulin is thought to increase the cellular permeability for sugar. As a result there is a quick oxidation of part of the sugar and the remainder is changed to glycogen and of course stored.

(2) Insulin is known to increase the basal metabolism with a rise in the respiratory quotient.

(3) Does increased water retention cause the gain in the weight? Falta does not think so, for the weight remains constant and even free diuresis does not cause a loss. He thinks there is a tissue accretion.

(4) Following observation of rabbits which are used to assay Insulin many observers think the gain in weight is simply due to fat deposition. Also Himwich and Spiers have shown that Insulin causes a decrease in blood fat, apparently due to storage in the tissues.

(5) There is an increase in appetite rather rapidly and with this is an increase in stomach capacity. The physiology is still obscure but the natural results of increased appetite, larger stomach capacity and a pleasure in eating will undoubtedly result in a gain of weight.

**Carbohydrates Adsorbed on Colloids as Antigens.**—Zozaya presents evidence that polysaccharides can be rendered antigenic by haptogenic adsorption on a colloid carrier. The polysaccharides studied were those of *Bacillus anthracis*, the meningococcus, *Streptococcus viridans* (Bargen), *Bacillus proteus*, *Bacterium morgani*, *Bacillus dysenteriae*, both the Shiga and Hiss types, and the pneumococci. With the polysaccharide of type III pneumococci, the author was unable in six weeks to produce any detectable protective antibodies, but he was able to produce anticarbohydrate antibodies. All the bacterial carbohydrates were nonantigenic alone when used in the doses indicated, though containing some nitrogen. Dextran, which was free from nitrogen, was also rendered antigenic by the adsorption method.

## BLEEDING FROM THE RECTUM\*

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A discussion of all conditions responsible for the discharge of blood from the rectum is not within the scope of this paper, so only the conditions most frequently encountered, and those originating in the colon, rectum and anus will be considered.

Blood passed through the rectal outlet may be either gross or occult. Gross blood may be distinguished by the unaided eye, while chemical tests are necessary to detect occult blood.

As a rule the presence of gross red blood, either free or mixed with or on the feces, indicates recent bleeding in the distal portion of the intestinal tract, while the most frequent source of black, digested or occult blood, is the gastroduodenal region. It must be remembered, however, that bleeding may occur in the proximal colon and the blood remain in the large bowel long enough to become black as a result of digestion; indeed, it has been shown that fresh blood in the pelvic colon may be carried back by reverse peristalsis into the transverse colon, or even to the cecum, and there undergo digestive changes.

Bleeding may be the result of either trauma or disease. If due to trauma the cause is usually obvious. The great multiplicity of pathologic lesions that may result in bleeding precludes a detailed discussion of them here; however, some of the more important ones will be mentioned.

Fecal impaction, either above an obstruction or in an otherwise healthy bowel, may produce pressure necrosis with bleeding. Post anal ulcer or anal fissure may be responsible for blood stains. Different forms of local ulceration, such as traumatic, strictural, stercoral, and hemorrhoidal, are not infrequently the cause of bloody discharges, while the ulcerations sometimes seen in serious constitutional diseases as nephritis, diabetes, biliary cirrhosis, typhoid fever, marasmus in infants, agranulocytosis, and allergic phenomena, may be responsible for serious or even fatal hemorrhages from the large bowel.

The coloproctitides, including chronic ulcerative colitis, as well as amebic and bacillary dysentery, may be the sources of exhausting hemorrhages. Tuberculosis of the rectum and colon sometimes produces bloody passages. Gonorrheal, chancreoid and syphilitic lesions of the rectum probably occur oftener than we suspect and are usually characterized by the passage of blood. Strictures

\*From Section on Proctology, Lexington Clinic.

Read before Mason County Medical Society, July 13, 1932.



of the rectum are notorious for producing ulceration and bloody stools. More or less bleeding usually accompanies rectal prolapse. The impaction of foreign bodies in the anorectal canal often causes the discharge of blood, although pain and tenesmus are usually the predominating symptoms. Non malignant tumors are often accompanied by bleeding; indeed angiomas may give rise to alarming, or even fatal, hemorrhages. The condition of so-called vicarious menstruation was formerly considered by some to be a clinical entity but it is doubtful if it exists. Bleeding from the rectum at the time of menstruation can nearly always be traced to organic disease which has been aggravated by the concurrent pelvic congestion.

In the above mentioned conditions it should be remembered that, while bleeding may be important or even alarming, other symptoms may, and often do, dominate the clinical picture. Indeed, other symptoms may be so predominant that the patient does not mention the passage of blood unless asked specifically about it.

Hemorrhoids. Rectal bleeding is probably most frequently caused by internal hemorrhoids. The bleeding follows congestion and erosion of the mass of dilated, sacculated venous channels which compose the main bulk of the pile. Trauma incident to the passage of a hard, dry stool is often sufficient to initiate bleeding. The amount of blood lost at any one time may be of little consequence, but not infrequently daily hemorrhages over a long period result in high grade secondary anemia or more serious systemic conditions. The diagnosis of internal hemorrhoids is usually easy, provided the patient is *examined*. The hemorrhoidal masses may protrude through the anus or they may be readily visualized through the anoscope. The treatment is surgical removal, or, in selected cases, the in-

jection treatment is often curative. (Fig. 1 and 2.)

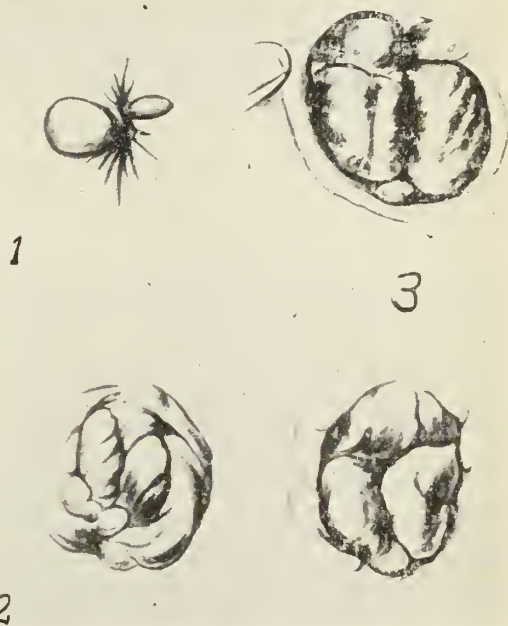


Fig. 2. Types of hemorrhoids. (1) External thrombotic hemorrhoid; (2) Internal hemorrhoids; (3) Prolapsing internal hemorrhoid (J. P. Tuttle, Diseases of Anus, Rectum and Pelvic Colon, New York, D. Appleton & Co.)

Malignant Tumors. Mortality statistics indicate that out of every ten persons above forty years of age one is doomed to die of cancer (1). More than 12.5% of all cancers are found in the rectum and colon and of these approximately one-third are located in the rectum within easy reach of the examining finger (Fig 3). One of the early symptoms of cancer of the rectum or colon is bleeding. In Yoemans (1) series of 320 cases bleeding was a first symptom in 128, or 40%. Any patient of any age who has passed blood from the rectum should be suspected of being cancerous until proven otherwise. While the majority of patients with cancer of the rectum are past forty years of age it may occur at any age. In 7,300 cases collected by Pennington (2), 40 patients were less than twenty years old. It is indeed a catastrophe when a casual and incomplete examination reveals hemorrhoids, or some other benign lesion that bleeds, when in reality a deadly malignant growth is lurking just above. This is not a product of fancy; it happens oftener than we would suspect. Buie (3) reports from the records of the Mayo Clinic that of every five patients with cancer of the rectum one had been operated on for hemorrhoids or treated symptomatically for intestinal irregularity.

Cancer of no other region of the body of-

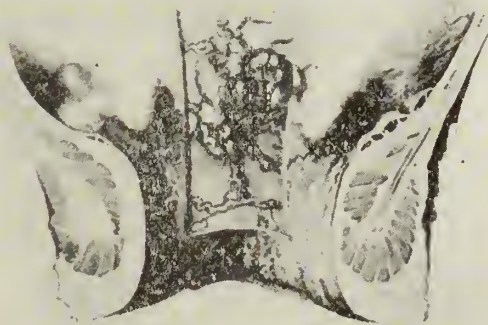


Fig. 1. Mechanism of hemorrhoidal development, (after Ball)

fers better chance of permanent cure than that of the rectum or colon (4), provided, of course, that diagnosis is early and that radical treatment is promptly instituted.

**Examination.** The most useful methods at our disposal for detecting disease of the lower intestinal tract are palpation, inspection and x-ray visualization. The sequence of these procedures is important. If the stool is to be examined the specimen should be secured before manipulative procedures are employed. The physical examination may immediately follow. This consists of inspection and palpation followed by proctosigmoidoscopy. Cultures or biopsy material may be secured at this time if desired. If there is reason to suspect lesions above the reach of the sigmoidoscope, x-ray examination with opaque enema should be used. This, however, should always be the last examination made and should not be made the same day as the instrumental manipulation because the latter may produce a traumatic irritability which is confusing to the roentgenologist (3).

It is interesting to note that the roentgenologic difficulty in visualization is greatest in the rectum and lower sigmoid due to superimposition of loops of bowel, and for this reason negative x-ray findings in this region are not dependable. With the sigmoidoscope, however, this region can be examined with extreme accuracy. For this

reason, and because the majority of colonic lesions exist below the lower sigmoid, proctosigmoidoscopy and digital palpation are perhaps the most valuable diagnostic procedures at our disposal.

#### CONCLUSIONS

1. The importance of investigating the cause of rectal bleeding cannot be over emphasized.
2. Regardless of the character of the bleeding it should not be assumed as diagnostic of hemorrhoids or of any other disease, but should call for a complete examination to determine its origin.

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#### A STUDY OF THE ARTERIOLES IN HYPERTENSIVE HEART DISEASE WITHOUT HYPERTENSION, CASE REPORT\*

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MORRIS M. WEISS, M. D.

and

MARION F. BEARD, M. D.

Louisville.

In 1929 there was reported before this Society a selected series of five cases of patients with hypertensive heart disease who were encountered during the non-hypertensive stage. At this time we intimated that we intended making biopsy studies of such patients in order to determine whether their arterioles showed the same characteristic changes that the known hypertensive had. Not infrequently individuals are encountered who have cardiac enlargement and normal or low blood pressure but no organic valvular lesion, adhesive pericarditis, severe anemia or other recognized cause for the enlargement. Even though the former level of the blood pressure is unknown, convincing clinical or pathological evidence of a pre-existing hypertension can always be found. Aside from the otherwise unexplained cardiac hypertrophy, these patients may show impairment of renal function or even uraemia, a suggestive roentgenologic cardiac silhouette, coronary types of electrocardiograms such as are so often found in the known hypertensive, ophthalmoscopic signs of known hypertension, and finally autopsy discloses diffuse arteriolar sclerosis which

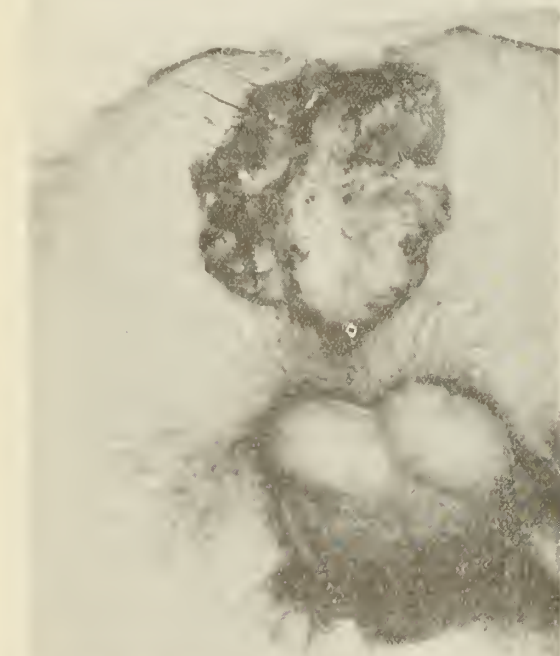


Fig. 3. Prolapsed cancer of rectum in a male, age 29. (Courtesy of Dr. Collier F. Martin).

\*Read before the Jefferson County Medical Society, June 6, 1932.



always evidences a persistent hypertension during the life of the individual.

The following case report is that of one of our patients of this type upon whom a autopsy was performed and who came to autopsy:

The patient was a male negro, aged 88 years, who was admitted to the Louisville City Hospital on October 16, 1930 complaining of weakness and dyspnoea of several years duration. There had been progressive oedema of the dependent portions of the body. During recent months attacks of non-radiating substernal pain were experienced and also frequent paroxysms of nocturnal dyspnoea. Neither the family history nor that of previous illnesses was of importance.

Examination revealed an undernourished, senile, orthopneic negro whose palpable arteries were sclerosed and tortuous. The blood pressure was 130/80 mm. Hg. with the heart markedly enlarged. There was a loud blowing apical systolic murmur and a totally irregular rhythm. A flat percussion note was present over the right lung base posteriorly but the voice and breath sounds were not dependable because the patient could not co-operate. The liver was palpable 3 cm. below the right costal margin.

X-ray examination confirmed the fact that marked cardiac enlargement was present. The urine was negative for albumin and glucose. His hemoglobin was 65 per cent, with 3,000,000 erythrocytes, 10,000 leukocytes and nothing unusual in the stained film. The ophthalmoscopic examination revealed abnormally pale discs, tortuous arterioles but no hemorrhages. The blood Wassermann was negative.

The blood chemical studies revealed the following findings:

Date	N-P-N	Urea-N	Creatinine
10-17-30	57	30	2.4
10-21-30	44.4	24.9	2.5
10-24-30	56.4	28.5	2.7

Two days following admittance he was more dyspneic and his blood pressure was 138/94 mm. Hg. Two days later auricular fibrillation was still present and he had a marked Cheyne-Stokes type of respiration. On October 21, 1930 a specimen of the deltoid muscle was obtained and sent to the pathologist. The arterioles were found to have wall-lumen ratio of 1:0.96. His blood pressure could not then be obtained with certainty. The oedema was approximately the same as on admission although he had been digitalized, placed on a restricted diet with limited fluids and received various diuretics. Because of his restlessness and inability to cooperate it was impossible to secure an electrocardiogram.

He died suddenly two weeks after admission to the hospital.

The necropsy was limited to the thoracic and abdominal cavities. The pericardial sac contained the usual amount of fluid and the heart weighed 510 gms. Organized thrombi were found in both atria. There was hypertrophy of the musculature particularly of the left ventricle, which measured 2.5 cm. in the thickest portion. At the apex there was some hemorrhage and softening of the myocardium with fibrosis of the papillary muscles. The aortic cusps were thickened and a moderate calcification of the aorta itself was present. Moderate sclerosis of the coronaries was visible though careful search failed to reveal a gross thrombosis.

The liver weighed 1100 gms., was firm and the cut surface showed a yellowish mottling. Nothing of interest was found in the lungs and the gastro-intestinal tract was not remarkable except for varicosities of the esophageal and rectal veins.

The right kidney weighed 150 gms. and there was a large yellowish, necrotic area on the posterior surface. In the remaining portion of this kidney there were a few old indentations which were interpreted as healed infarcts. The left kidney weighed 130 gms. and was studded with similar old indentations. Over these areas in both kidneys the capsule was adherent. On section these indentations extended well down toward the pelvis and appeared to be composed of scar tissue. The cortex and medulla were fairly well differentiated though the cortex was thinner than usual.

Microscopical Examination. Sections of the heart showed generalized enlargement of the muscle cells with some evidence of degeneration. In the cytoplasm of many of the cells there was a slight amount of brown pigment. There were a few small scars in the stroma which extended out into the muscle bundles and in these areas some of the muscle cells had undergone necrobiosis. The small vessels were fairly well preserved though in most of them the lumen appeared to be definitely narrowed. Section through the apical portion showed some of the smaller branches of the coronaries to be thrombosed.

The lungs showed "heart failure" cells and thickening of the walls of the air sacs. There was evidence of an early bronchopneumonia.

The liver showed a picture of chronic passive congestion as well as many petechiae. The arterioles were definitely narrowed.

The sections of the kidney showed considerable damage to the kidney substance by small infarcted areas. Associated with these were thickened vessels, the lumen of some being entirely closed. Sclerosis of the

capillary tufts was evident. A slight degree of acute degeneration of the tubule epithelium was noticeable though most of the epithelium appeared atrophic. In one of the sections there was a recent infarct in which the kidney substance was in an early stage of coagulation necrosis but unfortunately the occluded vessel itself was not in the section.

Measurements of the arterioles of the skeletal muscles showed a wall-lumen ratio of 1:0.93, which compared favorably with that in the biopsy. The wall-lumen ratio of the arterioles in the other organs was as follows: heart, 1:1.20; liver, 1:1.03; pancreas, 1:1.2; spleen, 1:0.83 and kidney, 1:0.87.

Clearly this patient presented arteriolar changes such as are ordinarily encountered in the known hypertensive and described by Kernohan, Anderson and Keith. We believe that biopsy studies are of definite confirmatory value in the diagnosis of "hypertensive heart disease without hypertension."

#### DISCUSSION

**Virgil E. Simpson:** I think the title of this case report "Essential Hypertension" may be misleading. If the intent of this case report be to focus attention on the likelihood of the physician seeing a case of hypertensive heart disease at a stage when hypertension no longer obtains, the title may be misleading.

If the intent be to present the conclusion that hypertensive heart disease may obtain without hypertension at any stage, then not the title, but the premise, may be misleading.

Unless some acute illness, jealous of its mortality battling average, fails to garner in the hypertensive heart disease subject prematurely, then congestive heart failure will make its inevitable advent. So long as the heart muscle is capable of physiological hypertrophy, while the vasomotor apparatus maintains tonus of the vascular bed, just so long will high blood pressure readings obtain in the hypertensive heart disease patient. If the development is gradual and if the patient is young, adaptation to each new level is relatively easy of accomplishment and the subject enjoys a reasonable capacity for work and a remarkable freedom from symptoms. In fact, even a highly intelligent patient may be shocked to learn a high pressure actually obtains. This period lasts a variable time in such patients, but to each, in time, comes dyspnea, edema, cough, heart hurry, harbingers of congestive failure. Seen after this for the first time, the physician who finds a blood pressure in normal range or lower may fail to recognize the case as one of hypertensive heart disease. The hall-marks of such a condition are to be found for the looking, nevertheless, and the astute clinician will not be deceived. Such a case is still hypertensive

heart disease; the evidence of congestive failure merely label the clinical picture of the terminal stage of such a condition.

But are we not invited rather to consider hypertensive heart disease without increase in blood pressure at any time in its clinical course? If such a thing be clinically possible, then were it not better that we discard the term hypertensive heart disease and seek one more descriptive? Considered from an etiological viewpoint may an agency provoke the development of a condition, yet leave it symptomless? May there be allergy, destroying its victim, yet no allergic phenomena? Viewed from a pathological consideration are we to expect the development of the organic changes in the vascular tree and in the heart conformative to the present conception of hypertensive heart disease and yet witness escape from the penalties of such pathology? Does one expect to find no thickening of vascular walls, no loss of elasticity, no lessening of lumen in arterio-sclerotic heart disease? If the vessels somewhere to some extent do not undergo arterio-sclerotic changes, can one then label such a case as arterio-sclerotic heart disease?

My feeling is that if the nomenclature is justified in carrying the term hypertensive heart disease, then will there be hypertension at some time in all cases properly diagnosed. If the condition called hypertensive heart disease may and does proceed to disaster without hypertension, then the nomenclature must need amendment.

I am in accord, in the main, with the classification of heart diseases suggested by the Heart Committee of the New York Tuberculosis Association and adopted with some changes by the American Heart Association. This classification can be had as an inexpensive manual and I indulge the hope that it will come to be a part of the library of every doctor. It should be used in classifying cases under treatment and not reserved for vital statistic reports alone.

**Glycosuria in Pregnancy.**—Chase found sugar in 66 of 100 urinalyses of pregnant patients. One patient who did 100 urinalyses found sugar 47 times. The earliest time in pregnancy that sugar was found was two months. Sugar tolerance curves were done on three pregnant patients and on three patients in whom glycosuria had persisted after delivery; the curves were similar to those found in persons with renal glycosuria. On the basis of her observations, the author concludes that glycosuria in pregnancy is normal. Its frequency depends on how thoroughly it is sought. It does not require dietetic treatment and probably does not predispose to the development of diabetes. It is differentiated from diabetes by the small amount of sugar present, by the absence of thirst, and by the presence of normal blood sugar curves.



## THE PRIVILEGE TO SERVE\*

LEON L. SOLOMON, M. D.

Louisville.

Your speaker is requested by the Woman's Auxiliary of the Kentucky State Medical Association, during a five minute's period, to address a radio audience on some topic of likely interest to the general public. He chooses as his theme, "The Privilege To Serve."

It will not be considered immodest, he hopes, for a practitioner of medicine to claim for his colleagues, a glory, in being permitted to render service.

Throughout the ages, the doctor has ever been man's trusted friend and dependable guide. Cheerfully, with gladsome smile, he responds to the call, neither scorching sun nor blighting frost holding him back when your summons comes.

The words of a local Doctor of Divinity are recalled at this moment. A number of years ago, the preacher inquired of this speaker, "Are you not exhausted, doctor, by your daily ministrations to the sick? Does not the word of encouragement you so consistently utter—even though all seems even to you cheerless and hopeless—result in your own physical depletion and mental fatigue?" And the reply is called to mind at this moment,—“the satisfaction which gives the physician an unending pleasure, as he makes his daily rounds, serves to prevent his exhaustion; though fatigue of mind and body are rarely absent, when he says his ‘Now I lay me down to sleep,’ the feeling of service, rendered, never ceases to be his blessed possession. Jealously, he guards the privilege to serve as the profession's richest heritage.”

In these strenuous days, when man is being sorely tried by the most far reaching of economic adversities, it is noteworthy that the doctor is not found lacking. The most praiseworthy of tender emotions—sympathy, love, compassion—never flowed more freely from the heart of the physician than today.

My listeners, be attentive, lend me your ears; hear, with pleasure, words of praise, spoken by a doctor of your doctor. Always neglectful of self, he sacrifices in its truest sense. And today, he performs a service, even superior to and nobler than that heretofore performed. Wholly without regard for material benefit or profit, he carries on among the sick and the needy from early morn till late in the night—even through the night, if you demand. Deal kindly with this physician; match your service with his service. Innumerable are the opportunities

and the instances, when you may lighten his load, gladdening his way and rejoice his heart. You will thus help a noble man in his effort to assuage pain and bring comfort, while you, too, will enjoy "The Privilege To Serve."

Remember what the doctor has accomplished within the span of your lifetime. Verily, they are wonders in your behalf. Has he not all but removed many dread diseases? Has not preventive medicine made infrequent the occurrence of typhoid fever, the malarial fevers, smallpox, scarlet fever, whooping cough, the diarrheas and dysentery? What of the bugbear of second summer babies—"summer complaint," but a few years ago, a terrifying term for parents?

What of that most distressing of ailments, croup, and of that mortal disease, diphtheria? Has not your physician played the role of benefactor to mankind in his mastery of these and other not less fearful morbid processes? In truth, doctor and surgeon are among the rarest of your blessings. Well may you join with both in thanking a beneficent Creator for "their privilege to serve."

SUBOCCIPITAL DECOMPRESSION IN  
TREATMENT OF BRAIN INJURIES,  
THREE ILLUSTRATIVE CASES\*

B. F. ZIMMERMAN, M. D., F. A. C. S.

Louisville.

The brain is unique amongst the other organs of the body, at least in the particular that it is encased in a fibro-osseous capsule that is absolutely inextensible by any physiological force. The brain is a semi-solid substance; it is about as incompressible as water. It is evident, therefore, that any encroachment on the intracranial space, as from hemorrhage or edema, must be at the expense of the blood or cerebro-spinal fluid, or both. The displacement of the cerebro-spinal fluid is extremely limited and it is evident that the increased pressure manifests itself principally through disturbance of the circulation. The pressure may increase to a point of producing actual herniation of the brain, the mid-brain through the incisura and the hind-brain through the foramen magnum.

The means usually employed for combating increased pressure are (1) limitation of fluid intake; (2) the use of dehydrating substances represented by a hypertonic solution; (3) repeated spinal puncture; (4) decompression and operative procedure. In many instances, the first three means suffice and in not a few no treatment avails and the patient quickly succumbs. There is an intermediate group

\*A radio talk over WHAS, September 7, 1932, 10:25 a. m.

\*Read before the Jefferson County Medical Society, Louisville, June 20, 1932.

in which after a fair trial of the conservative measures, operative treatment is of great value. It is our opinion that the profession has become ultraconservative; in that formerly many died from lack of conservative treatment now some die for want of more radical treatment. Conservatism is sometimes carried to such an extreme that it ceases to conserve either life or function. How often is the statement seen that in the absence of focal signs no operative treatment shall be employed except as a last and final resort. Should there be any wonder that the operative mortality rate is unusually high under such circumstances? Our principal effort is to preserve the integrity of the so-called vital centers, the medullary centers, those of respiration, the heart and vasomotor. To wait until there is evidence of failure of these centers to function, is to court disaster. It is our belief that these centers can be best protected in those cases where conservative treatment fails, by suboccipital decompression. A very serious doubt lurks in our mind as to the efficacy of the old subtemporal decompression even though it be bilateral. Certainly if it is to accomplish much, the opening must be a great deal larger than we have usually observed. A suboccipital decompression through a mid-line incision can be performed almost as quickly as a subtemporal, and increased pressure is at once removed from the vital centers by this operation. It must be apparent that pressure is not equally distributed throughout the cranial cavity and that those centers immediately adjacent to the site of decompression are relieved of pressure more promptly and effectively than those distant to the site of decompression. Again, in a case of severe cerebral intracranial pressure where our efforts are directed toward conservation of the vital centers, it is certainly reasonable to suppose that those centers can be best protected by release of pressure in their immediate vicinity. It was with this conception of the pathology of increased intracranial pressure that we first practiced the operation of suboccipital decompression. Our results have been gratifying, although the number of cases operated have not been many.

The following cases are reported here briefly, in the belief that they represent certain types which may be successfully treated by this method.

Case I. Case of severe increased intracranial pressure with subarachnoid hemorrhage.

E. G., Male, white, injured in an automobile collision May 6, 1928. Contusions of scalp. No demonstrable fracture of cranium. The symptoms were typical of severe increased intracranial pressure. Unconscious at times,

restless, with diminished reflexes, pupils moderately dilated and slightly responsive to light, pulse slow. Breathing slow and deep, at times with stertor, blood pressure well sustained at 160 mm. Hg. which appeared high for the age. Spinal fluid pressure 30 mm. Hg., fluid bloody. In spite of intensive conservative treatment, limitation of fluid intake, large doses of 50% glucose at 6 hour intervals, concentrated magnesium sulphate as retention enemas, and repeated spinal drainage, the patient's condition did not improve and at the end of 36 hours, all symptoms indicated that the pressure had not abated. A suboccipital decompression was done, with removal of posterior rim of foramen magnum. There was pronounced herniation of cerebellum into the bony defect on incision of the dura. The pulse rate promptly rose from 58 to 80 per minute, respiration became more regular and normal, within 12 hours there were indications of returning consciousness, and at the end of 24 hours patient recognized members of his family, he made a complete recovery.

In such cases, which are not infrequently encountered, where there are no focal signs to guide one, suboccipital decompression should be seriously considered. One must not wait, however, until there is evidence of actual failure of the medullary center as shown by falling blood pressure, increasing pulse rate and rapid, irregular breathing. To delay this long is to have lost an opportunity.

Case II. Hemorrhage, subtentorial, with marked symptoms of medullary pressure.

Boy, age 8 years. While riding a coaster down a fairly steep incline, fell backward, striking the occiput on the concrete pavement. Accident occurred December 28, 1929. The child was rendered unconscious by the impact, probably a concussion. Consciousness returned in about 15 minutes. When seen 1 hour after the accident, the pupils were contracted and did not respond to light. The symptoms of medullary pressure were marked, and unconsciousness had again made its appearance. Without waiting for an x-ray examination and without doing a lumbar puncture, a rapid suboccipital decompression was done and a clot disclosed under the dura. This was removed and the bleeding point (a cortical vessel) was ligated. Wound closed without drainage. At operation, a linear fracture in the occipital bone was disclosed.

I did not wait for an x-ray for the reason that I had previously had a fatality in a child who suffered a similar accident. This boy was in a semiconscious condition and died while being conveyed to the x-ray room. Considerable delay had occurred in getting him to



the hospital. Autopsy revealed a subtentorial clot.

I did not do a spinal puncture because I believe it to be a dangerous procedure in such cases. The contracted pupils and symptoms of medullary compression occurring early with evidence of occipital injury, are to me contraindications for spinal puncture.

Case III. Occipital injury with symptoms of medullary paralysis. Respiration 60 per minute, pulse 110. Unconscious and pupils contracted to pin point.

Mr. H. G. Age 54 years. Injured April 6, 1932 in an automobile accident. Was not immediately unconscious, but became so about 20 minutes later. He was transported a distance of 70 miles in an ambulance and was seen 6 hours after the injury. Spinal puncture by Dr. E. L. Henderson who called me to see the case, showed a clear fluid under a pressure of 35 mm. Hg. He had a lacerated wound over the occipital region and x-ray showed a shadow suggestive of fracture of occipital bone. The case seemed hopeless and the family was so advised. The only possible chance seemed to be in the direction of a rapid suboccipital decompression but we expressed the belief that the patient would expire on the operating table. Much to our surprise they decided to have the operation. When the bone was removed, the dura was seen to be very tense and upon incising it the cerebellum herniated promptly. There was an instantaneous improvement in pulse and respiration. He regained consciousness six hours after operation and made an uneventful recovery.

This was undoubtedly a case of acute edema involving principally the subtentorial structures. As was stated above, the clinical picture was that of paralysis of the medullary center which is regarded as a hopeless situation.

#### DISCUSSION

**Franklin Jelsma:** This report opens up a great many interesting points for consideration. Time precludes anything but a brief discussion of a few. I agree very thoroughly with Dr. Zimmerman in the idea that conservatism in the form of undue delay certainly many times causes a fatal or undesirable outcome in these acute cases. On the other hand, there are many cases in which too early an operative procedure will do the same thing; so it is a question of just when and in what particular type of head injury a suboccipital decompression and exploration should be performed. Two of three cases in this report received a direct injury to the subtentorial structures.

It seems that this operation is particularly indicated in those cases in which the injury was received directly in the subtentorial region and where the symptoms indicate that there is in-

volvement of the subtentorial structures.

The clinical manifestations are disturbances of the cranial nerves, usually the 4th, 6th and 7th, plus an evidence of medullary pressure. The pulse usually becomes slow and bounding, and if pressure is allowed to remain, it will become rapid, the respiratory rate and temperature rising with the pulse. If, on the other hand, signs of medullary compression are merely a part of the picture of general increased intracranial pressure, then I doubt the wisdom of suboccipital decompression for the reason that the midbrain very probably would be crowded into the incisura and cause a fatal pressure upon the mesencephalon structures.

These cases have been very interesting, Dr. Zimmerman, and I believe the usage of suboccipital decompression will be of definite value in many of the cases of subtentorial brain injury.

**D. Y. Keith:** The last case reported by the essayist was seen by me in his room shortly after being admitted to the Kentucky Baptist Hospital. He was in extreme shock, clothing wet with perspiration, breathing rapid and difficult. We doubted the wisdom of moving the patient to the radiographic room for examination.

Any attempt to move him caused violent vomiting, the vomitus was bloody and blood was oozing from nose and mouth. He appeared as if he would die at any moment, totally unconscious.

X-ray examination was very unsatisfactory, revealing a questionable injury to the skull in the occipital region. The chest examination was negative for fractured ribs or gross hemorrhage into the pleura.

With Dr. Zimmerman and Dr. Henderson, the family was advised that we thought he would die in a short while without treatment and would probably die before he could be prepared for operation and very likely would die before a decompression could be completed. His only chance was decompression to which the family quickly consented. I was very much surprised to learn the next morning that he had recognized members of his family. It was interesting to watch the rapidity of his recovery.

No later x-ray examinations were made to determine if he had a skull injury or the extent of such an injury if any was present. This certainly was an interesting instructive case. The results were brilliant. I wish the laity could be educated that a severe brain injury can occur without a demonstrable fracture of the skull by the x-ray.

**B. F. Zimmerman, (in closing):** I appreciate the discussion the gentlemen have given these cases.

Dr. Jelsma spoke about the first case as to whether patient had an occipital injury. My object in presenting these cases was to show three distinct types I have treated by this method. Most of the cases I have treated by

this method have been of the type called "General Increased Intracranial Pressure." I had misgivings very much like Dr. Jelsma regarding suboccipital decompression in cases of general increased pressure and fatal hernia into incisura; but I was very much gratified to find that the results in these cases were very satisfactory. Out of eight cases, there were two deaths, which was better, I am satisfied than any subtemporal decompression or conservative treatment would have given me. These cases, as Dr. Forsee has said, are cases which must be watched closely; and when one decides upon an operation, get some action or it will mean a fatality.

### AGRANULOCYTOSIS REPORT OF TWO CASES\*

J. Q. TAYLOR, M. D.

Paducah.

In reporting these cases of Agranulocytosis, the first has been under observation and treatment since September 15, 1930. During this period she has had four distinct attacks. The last attack was on September 4th and lasted until September 25, 1931, when she was discharged from the hospital but not allowed to go on duty. She has remained well, with white blood count and differential normal. She has gained in weight and looks the picture of health.

Case 1. Miss C. age 46, single, Laboratory Technician and X-ray Operator. Her previous illness—tonsillitis, appendicitis, and an occasional attack of malaria. Her history of the first attack of agranulocytosis, before being admitted to the hospital is as follows:

On September 7, 1930, she awakened about 7 A. M. feeling very tired and aching all over. At 8:00 P. M. that day she had a distinct chill followed by fever. September 8th white blood count—3000, no Poly's. No malarial parasites found. 5 grains quinine given every three hours until thirty grains given. No chill on the 10th. Blood smear—no Poly's, white not counted. September 11th, 4:00 P. M.—white blood count—2200, no Poly's. Severe headache, backache and feeling very weak and tired. Quinine grains five every three hours for six doses, with acid and pepsin. September 13th beginning inflammatory patches on gums. September 14th slight chill at 1:00 P. M., followed by fever and sweating. Patches on gums more inflamed. September 15th severe inflammation and pain of gums and mouth. This inflammatory lesion of mouth finally terminated in larger sloughing area about 3/4 x 1 inch, in roof of mouth left side. During the greater part of this attack patient was very nervous and mentally depressed and a

fatal termination was not unexpected. Admitted to hospital 1:30 P. M. severe chill about 4:30 P. M., temperature 102, pulse 110. Smear from gums showed staphylococcus, blood culture negative. There were no enlarged glands, liver and spleen not palpable, heart and lungs normal. Urine negative. X-ray of teeth negative. From the 15th to the 20th temperature ranged from 102 to 104, pulse from 100 to 136, respiration from 20 to 24. She was very uncomfortable during these five days. On September 20th, P. M. she was very much nauseated and seemed depressed. Temperature 104 and suffering a good deal. She was given 1/6 gr. morphia about 7 P. M., she became more comfortable and had a good night's rest. The temperature fell to normal during the night. The white blood count was 3,700, Poly's 5% on the morning of the 21st. Her temperature was normal and she was feeling better. Her white blood count 3,800, Poly's 18%. Table No. 1 gives white blood counts and differentials from September 16th to October 11th. The treatment during this attack was mouth washes, liver extract and Fowler's Solution drops 3 t.i.d.; laxatives and morphia when needed for pain. General diet. She continued to improve after the 20th and gained in weight, blood count became normal and in six weeks time seemingly had recovered and working full time.

The second attack, overworked herself getting ready for Christmas. December 24, 1930, feeling very weak and tired during the day. About 8:00 P. M. began aching. She took 5 grains aspirin upon retiring. December 25th awakened at 1:00 A. M. with a chill followed by fever. Blood count at 11:30 A. M.—white blood count 3800, no malarial parasites found, differential not made. December 26th white blood count 3000, Poly's 33%. Estivo Autumnal parasites found. Quinine grs. 5 for six doses. Patient kept on anti-malarial treatment for a month. No recurring chills and she continued on duty with blood count increasing to normal for the white blood count, but irregular Poly morphonuclear. Irregular until March 4th, 1931 when patient again had a chill at 8:30 P. M. No malarial parasites found. March 5th white blood count 3700, poly's 62%. Quinine grs. 5 every three hours for six doses. She continued on duty until March 19th, 1931. Poly dropping from 52% on March 10th to 2% the 12th and no poly on the 15th. She was very ill March 19th and was admitted to hospital. Blood count from March 18th to May 8th, 1931 see table No. 2. She was discharged April 4th, 1931 and on duty until May 4th, 1931.

May the 8th she had another chill and was admitted to the hospital. May 11th white

\*Read before the McCracken County Medical Society.



blood count 2100, poly's 6%. See table No. 3 for white blood counts and differentials from May 11th to August 4th, 1931. The white count dropped to 700 and two different days no poly's were found. Teeth showed much dental repair, the gums very edematous and dark in color, within a few days there was great swelling of lower lip and right cheek. Greater part of gums, especially lower became gangrenous with resulting bone infection lower maxilla and large pieces of bone were extruded leaving most of teeth very loose. These were removed after patient showed some improvement. At this time there occurred a large slough on the mucosal side of lower lip which soon included entire thickness of lip. Slough in the skin about the size of a dime. In the right cheek slough about  $1\frac{1}{2}$  inches occurred but did not include skin. After she began to improve she had three lower teeth extracted and bridge work removed on July 2nd. She had the rest of her teeth removed on July 7th. She had very little fever during this attack. Was discharged August 4, 1931 but was not allowed to return to work.

On September 4th she had another relapse. This was the fourth relapse. This lasted from September 4th to September 28th, 1931. See table No. 4 for blood counts and differentials.

I had read everything that I could find but did not find any treatment that seemed to be of any benefit. All the writers gave the pathology as the loss of function of the bone marrow. Feeling that there was a malarial element in addition to the disease of the marrow, I thought I would give her 15 grs. of quinine daily and 15 to 20 grs. of raw bone marrow three times daily. She has been kept on this treatment since September 25th 1931. She has had no further attacks and has gained in weight and looks better than before she became sick. It is now eight months since she has had a relapse. If her trouble was due to malaria the quinine has been beneficial. If due to disease of the marrow, then supplying her with the raw bone marrow during her convalescence would theoretically be the ideal treatment to prevent a relapse.

We know that the recovery of one case of any disease does not prove that the remedy we use is a specific, for recovery takes place in disease regardless of the treatment and we are apt to give credit to the last remedy given.

I believe that morphia given to relieve pain and procure rest and symptomatic treatment will do more toward carrying our patients to convalescence than any other means at our command. Dr. H. G. Reynolds looked after local mouth conditions. Dr. Frank Boyd and Dr. V. L. Powell saw her daily and were

consulted about her treatment. We used during her attacks various drugs to stimulate the white blood cells and Poly's, such as Cacodylate of Soda, Neo-Salvarsan, Mixed vaccine, Nuclein and intra-muscular injections of Bismuth. There would be a slight rise in the white blood count but it would not last.

Case No. 2. Admitted 2-26-32. Seen in consultation with Dr. H. P. Linn by whose permission I am reporting. Mrs. S., Housewife, age 61. General weakness, elevation of temperature, ulcers on gums, tongue and jaws. Onset about two weeks ago. Onset and course, about two weeks ago first noticed she had elevation of temperature and soon after that time was exceedingly weak. She has been confined to bed for the last few days due to weakness, about two days ago noticed the ulceration of mouth and throat which has become quite extensive. Previous history—she has had the usual diseases of childhood, pneumonia. Family history negative. Physical examination—general appearance, white female, age 61, high mentality, moderately nourished, skin—white. Hair—white. Muscles—flabby. Eyes and ears—negative. Chest—limited excursion, no rales, cavities or solidifications. Heart—rate, rhythm and force normal. Abdomen—no masses or tenderness. No enlargement of liver or spleen. G. U.—nocturia, no dysuria or pyuria. There are ulcers of the vagina. Married many years. One child died at six months. Extremities—no edema, tumors or varicosities. Glands—no swelling or soreness. Skin—white, no icterus, no acne, fever blister of lips. Tentative diagnosis: Agranulocytosis. Admitted to the hospital 2-26-32. Temperature  $102\frac{2}{5}$ , pulse 90, respiration 20. Feeling very weak and depressed. Urinalysis—color amber, s. g. 1016, acid reaction albumin—trace, sugar negative. Many squamous epithelium cells, few pus cells, few sodium urate crystals. Smear from mouth—staphylococcus. Blood picture—H. B. 60%, red cells 3,320,000, color index 000, W. B. C. 1700, small monos 89%, large monos 10, Poly's 0, Poly Eosin 1. Table 5 gives the differential and W. B. C. daily, from 2-26-32 to 3-8-32. Alkaline mouth wash for the mouth, amytal grs. 1 for rest. On the 27th she was given  $\frac{1}{6}$  gr. Morphia at 4:45 P. M. as the aspirin and pyramidon did not quiet her nor give her any rest. The morphia was given as needed for relief from pain, and to give her rest. On February 29th, 1932, the morning blood count was—W. B. C. 1250, Poly's 2%, and at 8:20 A. M. 5 gm. of Adenine sulphate given intravenously twice daily up to March 3rd. On March 4th raw bone marrow was commenced and also Fowler's Solution drops 3 t. i. d. The ulcers in the mouth were very much better and appetite returning, fever abating and the patient's condition

much improved, which continued and patient was discharged from hospital March 8, 1932. Since returning home she has gained in weight and strength and says she feels

better than in years. On February 28th her temperature reached 104 2/5, pulse 112, respiration 22. After that there was a gradual decline in fever until it fell to normal on the 2nd of March.

TABLE NO. 1—BLOOD COUNTS

Date 1930	H. B.	R. B. C.	Color Index	W. B. C.	Polys	Small Monos	Large Monos	Baso's	Poly Eosin	Myc-los	Trans	Cell Count	Mal. Par
9-16	80%	4,560,000	.9	3,200	8%	77%	15%	0	0	0	0	100	0
9-17	80%	4,496,000	.9	3,500	6%	71%	20%	0	0	0	3%	100	0
9-18	80%	4,432,000	.9	3,500	8%	60%	28%	0	0	0	4%	100	0
9-19				3,600	4%	67%	24%	0	0	0	4%	100	0
9-20				3,700	5%	64%	27%	1%	0	0	5%	100	0
9-21				3,800	18%	53%	28%	0	0	0	7%	100	0
9-22				3,900	48%	43%	5%	0	0	0	4%	100	0
9-23				4,500	57%	37%	5%						0
9-24	78%	4,184,000	.9+	5,300	52%	40%	8%	0	0	0	0	100	0
9-25				5,900	50%	39%	10%	0	0	0	1%	100	
9-26				6,000	55%	37%	8%	0	0	0	0	100	
9-27				5,700	61%	32%	6%	0	0	0	1%	100	
9-29				5,300	63%	30%	6%	0	0	0	1%	100	
10-1				6,700	63%	32%	4%	0	0	0	1%	100	
10-6				6,800	59%	35%	6%	0	0	0	1%	100	
10-11													

TABLE NO. 2

1931													
3-18				4,100	0	80%	12%	4%	0	0	4%	100	0
3-19				4,600	2%	89%	4%	3%	2%	0	1%	100	
3-20				4,500	3%	78%	11%	0	3%	0	5%	100	
3-20				4,500	7%	77%	11%	0	1%	0	4%	100	
3-23			A. M.	6,700	34%	55%	7%	0	2%	0	2%	100	
3-23			P. M.	5,700	62%	26%	6%	0	2%	0	4%	100	
Blood counts normal until April 1st.													
4-1				2,800	29%	60%	5%	1%	3%	0	2%	100	
4-2	88%	4,480,000	.1	2,900	4%	81%	11%	0	3%	0	1%	100	
4-3				3,400	0	83%	11%	1%	4%	0	1%	100	
4-4				3,000	2%	76%	14%	1%	4%	0	3%	100	
4-6				4,100	14%	66%	10%	0	6%	0	4%	100	
4-7 to 4-20	W. B. C. irregular from 3,500 to 5,700—Poly's irregular from 17% to 50%							0	0	0	0	100	
4-21				7,900	76%	23%	1%	0	0	0	0	100	
4-22				6,600	41%	49%	6%	1%	3%	0	0	100	
4-23 to 5-8	A. M. irregular from 4,700 to 6,600—Poly's 43% to 60%												
5-8 3:30	P. M. Chill; 8 P. M. chill												
5-9				2,200	16%	74%	6%	0	0	0	4%	100	

TABLE NO. 3

Date	H. B.	R. B. C.	Color Index	W. B. C.	Poly's	Monos Small	Monos Large	Baso's	Tran's	Eosin's	Mye-los	Count Cell
1931												
5-11				2,100	6%	87%	6%	1%	0	0	0	100
5-12				2,500	1%	82%	13%	0	3%	1%	0	100
5-13				2,900	4%	81%	9%	2%	4%	0	0	100
5-14				2,900	4%	82%	11%	0	3%	0	0	100
5-16				1,900	8%	76%	10%	0	2%	4%	0	100
5-18				4,100	11%	73%	12%	0	3%	1%	0	100
5-19				4,200	24%	62%	7%	3%	2%	2%	0	100
5-20				5,200	25%	69%	4%	0	0	2%	0	100
5-21			A. M.	5,500	51%	42%	6%	0	0	1%	0	100
5-21			P. M.	3,600	18%	75%	6%	1%	3%	1%	0	100
5-22				2,300	45%	47%	6%	0	2%	0	0	100
5-23				3,900	42%	50%	7%	0	1%	0	0	100
5-25				3,200	21%	61%	6%	1%	1%	0	0	100
5-26				2,700	3%	88%	6%	2%	1%	0	0	100
5-27				4,400	4%	82%	9%	1%	4%	0	0	100
5-28				3,700	0	90%	6%	0	3%	1%	0	100
5-29				3,200	4%	84%	9%	1%	2%	0	0	100
5-30				3,300	17%	76%	5%	1%	0	1%	0	100
6-1				2,900	12%	82%	4%	1%	1%	0	0	100
6-3				3,400	4%	85%	8%	0	3%	0	0	100
6-5				3,500	1%	87%	10%	0	2%	0	0	100
6-6	78%	4,096,000	.9+	3,200	3%	90%	5%	0	2%	0	0	100
6-8				4,700	7%	83%	9%	0	1%	0	0	100
6-11				4,000	3%	87%	6%	1%	0	0	0	
Basket Cells												
6-11											3%	
6-13				2,000	5%	82%	7%	0	2%	1%	3%	
6-15				1,000	12%	75%	7%	0	2%	0	4%	
6-17				700	11%	69%	15%	0	1%	0	4%	
6-18				1,300	9%	80%	7%	0	2%	0	2%	
6-20				2,100	13%	65%	7%	0	3%	0	12%	
6-22				2,300	27%	50%	4%	0	10%	0	9%	
6-24	65%	3,640,000	.9+	3,500	45%	39%	2%	0	12%	0	2%	
6-27				4,300	46%	30%	7%	0	8%	0	9%	
6-30				5,100	41%	47%	4%	0	5%	0	3%	
7-3				3,500	43%	46%	2%	0	5%	0	4%	
7-6				3,000	58%	35%	3%	0	5%	0	1%	
7-8				4,900	52%	42%	4%	0	0	0	2%	
7-11				4,300	21%	69%	5%	2%	0	0	3%	
7-13				4,100	43%	38%	3%	0	5%	2%	9%	
7-15				3,700	27%	69%	2%	0	0	1%	1%	
7-18				3,700	32%	61%	3%	0	1%	1%	2%	
7-21				4,200	24%	70%	2%	0	0	0	0	
7-25				4,500	49%	47%	3%	0	0	1%	0	
7-30				4,800	46%	50%	3%	0	0	1%	0	
8-4				4,700	45%	50%	4%	0	0	1%	0	



TABLE NO. 4

Date 1931	H. B.	R. B. C.	Color Index	W. B. C.	Poly's	Small Monos	Large Monos	Baso's	Tran's	Poly Eosin	Basket Cells
9-4				2,100	32%	64%	4%	0	0	0	
9-5				1,700	27%	72%	0	1%	0	0	
9-7				1,950	31%	68%	1%	0	0	0	
9-8				2,700	12%	49%	5%	0	0	2%	
9-9				3,100	7%	80%	6%	1%	2%	4%	
9-10				3,200	4%	86%	6%	0	1%	2%	1
9-11				3,500	2%	86%	7%	0	3%	2%	0
9-12				3,700	2%	85%	5%	2%	1%	5%	0
9-14				3,500	8%	79%	5%	0	4%	4%	0
9-15				4,500	23%	69%	6%	0	0	2%	0
9-16				4,400	42%	54%	2%	0	0	2%	0
9-17				3,700	20%	71%	4%	3%	0	2%	0
9-18				4,350	32%	60%	4%	2%	0	2%	0
9-19				3,800	17%	77%	4%	0	0	0	0
9-21				3,000	26%	70%	3%	0	0	1%	0
9-22				3,450	34%	58%	6%	0	0	2%	0
9-23				4,200	13%	80%	4%	0	0	3%	0
9-24				4,250	38%	62%	4%	0	0	4%	0
9-25				3,400	18%	78%	3%	0	0	1%	0

TABLE NO. 5

Date 1932	H. B.	R. B. C.	Color Index	W. B. C.	Small Monos	Large Monos	Poly's Neutro	Poly's Eosin	Baso's	Tran's	Mylo
2-26	60%	3,320,000	.9	1,700	89%	10%	0	1%			
2-27				1,000	92%	8%	0	0			
2-28				1,250	90%	10%	0	0			
2-29			A. M.	1,250	92%	6%	2%		Adenine Sulphs. 5 gm.		
2-29			P. M.	2,400	80%	4%	16%		Adenine Sulph. 5 gm.		
3-1			A. M.	2,200	76%	2%	22%		Adenine Sulph. 5 gm.		
3-1			P. M.	1,900	54%	6%	40%		Adenine Sulph. 5 gm.		
3-2			A. M.	1,700	65%	5%	30%		Adenine Sulph. 5 gm.		
3-2			P. M.	3,250	60%	6%	34%		Adenine Sulph. 5 gm.		
3-3				2,250	74%	6%	20%		Adenine Sulph. 5 gm.		
3-4				2,100	56%	6%	38%		Adenine Sulph. 5 gm.		
3-5				1,700	60%	15%	25%		Bone Marrow and Fowler's sol		
3-7				2,700	75%	5%	20%				
3-8				3,500	72%	6%	22%				

## FATAL HEMORRHAGE FOLLOWING EROSION OF THE INTERNAL CAROTID ARTERY\*

ARMAND E. COHEN, B. S., M. S.

Louisville.

Dr. Iglaue's recent address before the Eye, Ear, Nose and Throat Section of this Society apparently has stimulated interest in the infections of the neck.

Hemorrhage and death following erosions of the large cervical vessels is probably more frequent than is indicated by the few reports appearing in the literature.

The case history I am about to present has previously been reported in "The International Journal of Medicine and Surgery." That report embodied merely the report of the case and the excellent pathological study by Dr. A. J. Miller. This evening we are particularly fortunate in that the men who served as consultants are presenting the history of their relation with the case. I want to thank these men for their kindly assistance with the case and their goodly co-operation tonight in presenting it to this society.

### CASE REPORT

L. H. B. a twelve year old girl, was seen January 14th, 1931 at which time she complained of sore throat and head cold. She had always been a delicate child and her general health was not improved following tonsillectomy in 1924.

Aside from an x-ray and physical diagnosis

of healed pulmonary tuberculosis, the most important findings were in the naso-pharynx. The nasal membranes were congested and an excessive amount of watery discharge was present. The pharynx was markedly injected, and small pieces of acutely infected stubs of tonsils were present bilaterally. The right ear drum was slightly reddened, but there was no bulging. The right sternomastoid muscle was slightly swollen and tender. A marked adenitis of the right cervical glands was present. X-rays and transillumination of the sinuses were negative. The temperature was 101 degrees F. The blood count showed 24,850 white cells, 3,080,000 red cells, Hemoglobin 70%. The differential count showed 19% lymphocytes and 81% polymorphonuclear leukocytes. The blood calcium was 6.58 mgm.%. The blood Wassermann was negative. The examination of the urine aside from a trace of albumin and an occasional pus cell was normal.

The patient was immediately referred to an otolaryngologist. The treatment consisted of that usually accorded patients with severe nasopharyngeal infections, namely absolute rest in bed, forced fluids, liquid diet, anti-pyretics, eliminations, hot antiseptic gargle, phenol and glycerine installations in ear; ephedrine and neo-silvol installations in the nose.

One week later the otolaryngologist reported as follows, "The ears are now normal in all respects. The naso-membranes and turbinates are normal. The pharynx is now only slightly injected. I do not feel that these findings could in any way account for the continued temperature, the myositis or

\*Read before the Jefferson County Medical Society, May 2, 1932.

adenitis. The gums are red and congested and several teeth are in the process of eruption. I cannot say that the dental conditions accounts for her symptoms, but think it worthy of consideration.

On January 19th, the patient was seen by another laryngologist who felt a distinct mass in the posterior pharyngeal wall. An incision was made in that area but no free pus and only little drainage resulted.

The following day the patient suffered a terrific hemorrhage from the nose and throat. The red cells fell to 2,450,000, the hemoglobin to 40%. The white cells increased to 34,800. The patient was removed to the Jewish Hospital and a transfusion of 500 cc. of whole blood was given. At this time a marked dilatation of the right pupil was noted. No evidence of mediastinal mass could be determined. The patient's convalescence was rapid. On the fourth day following her admission to the hospital, the temperature became normal, and her general condition so markedly improved, that she was permitted to return home.

Following a slight hemorrhage from the naso-pharynx, one week later, January 30, 1931, the patient returned to the hospital. She complained of some pain and a slight mucous discharge from the right ear. The ear condition improved rapidly, following irrigations with boric solution. The right pupil was still dilated and the adenitis and myositis persisted. The blood count showed 3,700,000 red cells, 69% hemoglobin and 8,700 white cells. The differential count showed 69% polymorphonuclear cells, of which 64% were segmented and 5% were staff forms, lymphocytes 23% eosinophiles 3%, monocytes 5%. The blood culture was negative. Because of the posterior pharyngeal mass and the absence of temperature and leukocytosis the possibility of a malignancy was considered. Ten milligrams of radium was implanted in the throat and left in place for 4 hours. Three days later at 12:15 A. M., the patient suffered a fatal hemorrhage from the nose and throat, expiring at 1:05 A. M.

The number of case reports of erosion of the carotid artery or its branches, in the presence of cervical abscesses is relatively small, and most are found in the foreign literature. Since 1919 we have found reports of 66 cases, ours making 67.

Regarding the clinical symptoms of a peritonsillar abscess which point to a perforation, the following factors are to be considered:

1. A protracted course of peri-tonsillar abscess.

2. A marked adenitis of the glands posteriorly and below the angle of the jaw.

3. The marked sepsis of the patient in the

case of tonsillitis having a severe course.

4. Failure of the mass in the para-pharyngeal space to disappear after the abscess is opened.

5. Dilatation of the pupil on the affected side.

6. Hemorrhage from the naso-pharynx not otherwise accounted for.

#### PROGNOSIS AND TREATMENT

Unless the common carotid artery is promptly ligated, the prognosis of erosive bleeding of the carotid artery is invariably bad. In fact since Serceer (1) published his report in 1927 there have been but two cases reported in which failure to ligate in case of erosion of the internal or external carotid, was not followed by death. Serceer suggests ligation if the glandular swelling in retro-tonsillar abscess does not promptly disappear after the abscess is opened. Such a procedure would eliminate severe complications such as thrombosis of the large cervical vessels, of the cavernous sinus or the development of meningitis. The advantage of ligation over conservative treatment is shown in the following table published by Ortman (2) in 1930 and to which are added two cases by Lukens (3), six by Iglauer (4), and the one reported by us.

Author	No. of Cases	With Ligation	Deaths	Without Ligation	Deaths
Lebron.....	23	10	2	13	12
Hubbers.....	3	1	0	2	2
Stumff.....	14	6	1	8	6
Serceer.....	16	9	3	7	4
Thornval....	1	1	0	0	0
Ortman.....	1	0	0	1	1
Lukens.....	2	1	0	1	1
Iglauer.....	6	2	0	4	2
Cohen.....	1	0	0	1	1
	67	30	6	37	29

Of the 67 cases reported there were 35 deaths or 52.2%. Of the thirty treated with ligation there were 6 deaths or 20%. Of the 37 treated without ligation there were 29 deaths or 78.4%.

In one of the fatal cases mentioned by Iglauer, the attending surgeon had placed a ligature around the carotid but did not tie it. A nurse at the bedside was instructed to tie the ligature in case of further bleeding. During a brief absence of the nurse from the bedside the patient bled to death. Iglauer likewise recalls a case in which ligation of the internal carotid was insufficient to control the hemorrhage and it was necessary to ligate the external carotid also before the co-lateral bleeding could be controlled.

Thornval (5) suggests exposing the common carotid and placing a tie and hemostat around that vessel and at one's ease open the abscess cavity and look for the bleeding ves-



sel. If the bleeding is from the branches of the external carotid that part may be ligated but if from the internal carotid or from the bifurcation the common carotid should be tied off.

The danger of ligation of the common carotid is of course, cerebral complications, either an ischemia, thrombi, or emboli and subsequent infection or hemorrhage. Among younger individuals the procedure should be fraught with little danger as the majority recover and is indicated even should the patient be exsanguinated. Among older individuals the danger is great but in so serious a condition there is nothing to be lost by attempting a ligation.

#### CONCLUSION

Erosion of the large cervical vessels must be suspected in all cases of hemorrhage from the naso-pharynx, especially if a retro-pharyngeal abscess be present which runs a protracted course or if the infection is of especial virulence.

Prior to the appearance of hemorrhage from the pharynx or external auditory meatus symptoms may be present pointing to an erosion of the internal artery, such as swelling in the posterior mandible region.

Ligation of the common carotid artery on the affected side plus immediate transfusion offers the best prognosis.

In the case reported here the erosion was due primarily to tuberculosis with the pneumococci as a secondary invader. While ligation might have been of temporary value the erosive process no doubt would have continued and the ultimate progress would have been very unfavorable.

#### REFERENCES

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#### Determination of Lung Volume by Respiration of Oxygen Without Forced Breathing.—

Sendroy and his associates describe a method for estimating the volume of air in the lungs by the familiar principle of mixing this air with a measured volume of oxygen, and determining the extent to which the nitrogen of the pulmonary air is diluted. By employing a scrubber to remove carbon dioxide, and by measuring the volume of gas in the extrapulmonary part of the system at the end instead of the beginning of the respiratory period, it is possible to prolong the period to as many minutes as are necessary.

#### RETROPHARYNGEAL ABSCESS IN A CHILD, WITH AUTOPSY FINDINGS\*

CLAUDE T. WOLFE, M. D.

Louisville.

Retropharyngeal abscesses of specific nature as sequelae of caries of the cervical spine constitute a relatively common clinical picture in childhood, as observed in a careful search of the medical literature. Considerably less common and therefore, less well known, are tuberculous retropharyngeal abscesses of this origin. Because of the rarity of such cases the report of this case of retropharyngeal abscess which originated in a tuberculous caseous, retropharyngeal lymph node seems worthy of attention.

On January 19, 1931, at the request of Dr. David Cohen I was called to see Miss L. B., a girl of 12 years. Her chief complaint was nasal congestion and sore throat.

Examination of her nose showed some intumescence of the lower turbinates, but insufficient to cause marked embarrassment in breathing. The septum was in good alignment and shrinkage of the mucosa failed to disclose any pus or undue amount of secretion. Bed side transillumination showed the anterior group of sinuses negative. Since her temperature of approximately 100° F. persisted it was suggested that an x-ray of her sinuses be made. This was accordingly done and corroborated our negative clinical findings. The mucus membrane of the pharynx was congested especially on the right side. Evidence of a tonsillectomy was noted but there remained small stubs of lymphoid tissue in each lower fossae which are often observed following the removal of tonsils, as nature many times, in my opinion attempts to compensate for the loss of "something" and throws out this type of tissue to the embarrassment of all laryngologists. On the right side this tissue was markedly inflamed. The left side of the pharynx was but slightly injected. The usual local palliative treatment was instituted.

Several days later the right ear became painful. The drum membrane was slightly congested, particularly along the handle of the malleus, but no bulging or increased redness developed and the condition responded to the usual treatment.

As we could find nothing to account for the continuous temperature Dr. Cohen suggested that Dr. O. O. Miller go over her chest. I was present at this examination and feel sure that Dr. Miller found no evidence of an active tuberculosis.

Her pharyngeal pains persisted and grad-

\*Read before the Jefferson County Medical Society May 2, 1932.

ually there developed a bulging inward of the right lateral pharyngeal wall. Under careful and repeated observation covering a period of several days we saw this mass slowly increase in size until it filled the original tonsillar fossae. Digital examination gave one the impression of a rather soft semi-fluctuating tumor. A very superficial incision disclosed a blood clot and no pus. The clot was not molested and no free bleeding was noted.

The following morning we saw the patient and she seemed to be doing nicely but late in the evening we were called and advised that she was having a hemorrhage from her throat. When we reached her bed side very soon thereafter, the hemorrhage had ceased, the throat was dry and we could not be certain where the bleeding had come from.

After observing her for approximately 30 minutes we saw no evidence of further bleeding and departed.

A complete blood count made the following morning showed that she had been considerably depleted through hemorrhage. As soon as possible she was removed to the Jewish Hospital and a blood transfusion was done by Dr. Wallace Frank. Her response was wonderful.

The temperature returned to normal gradually and within a few days we felt that she could return home with safety.

We were in touch with her daily either by telephone or visit and her improvement seemed satisfactory until on the 4th day after her return from the hospital she complained of pain in the right ear. I was advised of this about 10 o'clock in the morning and when I reached her bed side about 2:00 P. M. I found the ear to be discharging slightly from a perforation in the drum in the right inferior quadrant. The perforation seemed adequate and its location did not warrant surgical procedure. Accordingly, the usual treatment was advised and the condition responded readily.

On January 30, 1931 a second hemorrhage from her throat warranted her returning to the Jewish Hospital for observation. The bleeding stopped of its own accord.

On Monday, February 2, 1931, Dr. Gaylord Hall was called in consultation and advised further exploring of the mass in the pharynx; this was done and only a blood clot was encountered. The inward bulging of the right pharyngeal area did not decrease and the possibility of malignancy was considered. Realizing that radium could not harm, Dr. Wallace Frank and I implanted needles in the mass. No beneficial effects were noted from this procedure.

On Friday, February 6, 1931, at 1:00

o'clock A. M. with the patient apparently doing nicely, she had a severe hemorrhage with blood coming from nose and throat, and expired in a very short time.

A post mortem by Dr. A. J. Miller disclosed the true cause of her death as follows:

**External Examination:** Revealed the body of a well nourished girl. Lips and finger nails and even the dependent portion of the body were pale. Examination of the viscera of the trunk revealed nothing except that there were small blood spots in the lungs. These areas measured from a few mm. up to  $1\frac{1}{2}$  cm. They were slightly firm and definitely subcrepitant. Sections of these areas revealed blood in the air sacs apparently from aspiration. In the apex of the right lower lobe there was a cluster of conglomerate tubercles measuring about  $2\frac{1}{2}$  cm. in diameter. These had caseous centers.

Microscopic study revealed, however, that granulation tissue was organizing the caseous material and it appeared the tubercles were healing. Direct smears and acid fast stains revealed a moderate number of organisms consistent in morphology to the bacillus tuberculosis.

On examination of the posterior-pharyngeal wall a longitudinal incision, 2 cms. long, was found in the mucosa to the right of the midline at the level of the second cervical vertebra. This incision extended into a cavity filled with laminated blood clot. Most of the wall of the cavity with its contents was excised. Further examination revealed the right internal carotid artery passing through the wall of the cavity and in this vessel there was a small round opening about 2 mm. in diameter through which blood had escaped into the post-pharyngeal abscess and from there into the pharynx.

Sections of the abscess wall revealed some recently formed granulation tissue, considerable fibrin and, toward the central portion, caseous necrosis. In this granulation tissue tubercle bacilli were found in moderate numbers.

The post-mortem interpretation of the findings is as follows: That there was a recent tuberculosis of the apex of the right lower lobe with perhaps secondary lesions in the right post-pharyngeal lymph node. The latter lesion eroded into the right internal carotid artery at the level of the second cervical vertebra and death resulted from hemorrhage from this vessel.

#### DISCUSSION

**J. Garland Sherrill:** This condition is more than a retropharyngeal abscess and is in reality in its later state a traumatic or dissecting aneurysm, with the blood escaping beneath the clot, and later reaching the throat through an opening in the aneurysmal sac.



If such an aneurysm reaches any size, pulsation and a bruit may be elicited on examination. In this case the small size of the sac may have prevented the observance of either pulsation or bruit.

That an erosion of a large artery may occur as the result of the extension of an inflammatory process in adjacent tissue must be admitted, but it is of rare occurrence. In most cases the wall of the artery has been damaged by traumatism without being severed.

A condition such as the one reported can be handled much more safely by an external incision rather than through the pharyngeal wall with the structures in plain view. Hemorrhage from the arterial trunk can be temporarily controlled by direct pressure until permanent methods of hemostasis can be applied.

This type of surgery requires boldness and dexterity to obtain the best results.

**B. F. Zimmerman:** I would like to stress one point that Dr. Sherrill made in regard to diagnosis of these conditions. Whenever there is intermittent bleeding from the pharynx, or elsewhere, always be on the lookout for hemorrhage as the result of ulceration into a large vessel. I have seen such hemorrhages. Some of you men here this evening will remember a case we had back in 1918, Base Hospital 52 Rimacourt, in which the carotid was nipped by a gun-shot. This man had been shot ten days before, in the left cheek and was apparently convalescing normally. I happened to be making rounds and was in the adjacent ward at the time he had a terrific hemorrhage. This patient had three convulsions, but finally under local anesthesia we succeeded in ligating the common carotid artery. He made an uneventful recovery. I have seen a man with a hemorrhage from the deep epigastric artery who had a suppurative condition following an appendectomy. There was intermittent bleeding for about two days. Hemorrhage became excessive and was only finally controlled by operation. One should be very careful whenever there is an infection about these large vessels, and particularly when there has been intermittent bleeding. Always be on the lookout, and have ready facilities to perform a ligation. Better still, if in doubt, take a chance on ligating before there is ulceration and uncontrollable hemorrhage.

**A. E. Cohen,** (in closing): This is one of the most interesting cases I have observed.

Because of the x-ray evidence of healed pulmonary tuberculosis we were placed somewhat on the wrong tract in trying to determine the origin of these hemorrhages. The mass in the throat was not large and did not pulsate. There was no bleeding point which could be seen inside the throat. None of us suspected an erosion of the common carotid. However, I am sure had there been such a suspicion the surgical consultants would have insisted upon

an exploratory operation.

In reading over the case histories which have been reported, I was struck by the similar progress of the disease and the similar confusion in diagnosis and treatment. Our purpose in presenting this paper has been to call to the attention of the medical profession the possible danger from hemorrhage from the nose and throat—particularly when the origin is not recognized.

**Claude T. Wolfe,** (in closing): I have very little to add except to emphasize the fact that the case was watched very carefully by all of the consultants and myself.

With negative x-ray and clinical findings, all of us felt that watchful waiting was justifiable in view of the improvement that the patient was showing.

#### DIAGNOSIS AND TREATMENT OF BORDERLINE HYPERTHYROIDISM\*

W. O. JOHNSON, M. D., F. A. C. S.

Louisville.

The differential diagnosis of borderline hyperthyroidism from certain other non-toxic conditions presents indeed a difficult problem.

We must first understand what is meant by "hyperthyroidism." This term is generally used to define a disease of unknown etiology, which is associated with an abnormally increased secretion of the thyroid gland, a "syndrome disease," in which there is a background of psychopathic inadequacy in the individual, and upon which the excessive secretion of the thyroid gland is brought to bear, thereby producing the symptoms as found in the disease.

To define a border line hyperthyroidism we may call it a mild hyperthyroidism, in which the history is indefinite, the symptoms atypical, and the basal metabolism below plus thirty.

This condition may be of long standing, and unsuspected, and mistakenly treated for many other conditions. However, the tendency of many physicians to suspect and treat any complaints associated with "nervousness" as disorders in the thyroid function has lead them to diagnose many cases as hyperthyroidism that are not primary thyroid disorders.

There are a few conditions which may readily be mistaken for hyperthyroidism, but are not relieved when so treated. The most common of these are "exhaustive neuroses," "neuro-circulatory asthenia," some cases of tuberculosis, some early forms of maniac depressive insanity, and some early agitative forms of Parkinson's disease. The purpose

\*Read before Muldraugh Hill Medical Society, Lebanon, August 11, 1932.

of this paper is to differentiate the symptoms and findings of borderline hyperthyroidism from similar conditions, and present the operative results in such cases.

For a more accurate study I will select sixty-eight cases reported by Clute, and twelve of my own cases, whose basal metabolism was below plus thirty, 22% of these cases being plus or minus fifteen. All have been subjected to thyroidectomy and have been followed at three month intervals for at least one year by clinical studies and metabolism tests.

**History:** The onset of the symptoms are usually insidious and vague, generally dating back for years, and, not infrequently they are associated with more or less constant poor health and frequent "nervous breakdowns," and other evidences of impaired health.

"Nervousness," however, is the most frequent and constant symptom, present usually throughout the course of the disease and almost invariably associated with the other symptoms. The word "nervousness," however, is very difficult to analyze. In some people it implies only a shakiness of the hands and a tremulous body, in other cases, mental unrest, uneasiness, and inward agitation which is not controlled, and with a great many people, habitual nervous movements alone are interpreted as nervousness. So one must first define what the nervousness of hyperthyroidism is before it can be separated from the other nervous manifestations.

The patient with hyperthyroidism is usually optimistic and hopeful of the future, not readily convinced that she is ill, and though she may be almost completely incapacitated is, nevertheless, still ambitious, and will persist in saying that she feels well and is perfectly able to carry on her work. Unless her nervousness is called to her attention, she is not really conscious of it. The nervousness of a hyperthyroid patient is not actually a conscious nervous state, but is a conscious driving force within the individual which she feels must be satisfied; and only by her clumsiness or having others call attention to her trembling, does she become conscious of nervousness in the early stages.

There is one form of shakiness in the hyperthyroid state that is rather characteristic. Besides the digital tremor, there is a vibratory tremor felt in the muscles of the forearm which is of great diagnostic significance in these cases, for it is present in very few other conditions; (obtained when the fingers are extended and hand of examiner on forearm.)

Associated with this nervousness, a new mental state is frequently developed, one of marked instability, and the patient may pass

frequently from laughter into tears without adequate cause. Marked irritability and inability to adjust herself to the usual routine of life develop in the patient who has previously been amiable, but through it all, there is usually an optimistic trend.

Palpitation of the heart is the next most constant symptom, and is usually the chief reason for seeking medical assistance. This palpitation comes on at any time of the day or night, and is commonly felt after meals, and always with the least over work or excitement. But one outstanding factor is that the palpitation of hyperthyroidism usually occurs at night, and keeps the patient awake, or awakens her at night. It is not always related in its onset to exertion, fright or excitement, but often comes when the patient is sitting quietly or in bed.

Increased fatigueability is a frequent complaint, with even a small amount of exertion. The patient is ambitious and quite anxious to work, but is unable to do so because of fatigue. The leg muscles are usually the first to be noticed, especially when walking upstairs (quadriceps). This may be an early and extremely good diagnostic lead. The patient notices first a shortness of breath, then fatigueability in climbing stairs.

In the borderline hyperthyroidism, as in the definite cases, the increased susceptibility to heat is a significant factor. There is first an increased sense of body heat, and with it a marked increase in perspiration which is noticeable to the patient at times, hot flashes in the upper part of the body. The patient also notices that she is more and more uncomfortable in rooms which are comfortable to others. The appetite is usually always good, not as ravenous as in marked hyperthyroidism, and one outstanding factor is that with good appetite there are very few, if any, digestive disorders, and the bowels are usually not constipated when they may have been troublesome before.

In these cases the variations in weight are not great; the patient may gradually, over a period of months, become thin, but there is no sudden loss in weight, and this loss in weight is in the presence of a constantly good appetite and no digestive disorders.

The menstrual order may not be changed, and if changed, usually becomes gradually diminished in flow; but there is no change in regularity and usually no other specific symptoms noted referable to the pelvis.

So we see in the history of true borderline hyperthyroidism a driving, optimistic, hopeful nervousness, associated with palpitation of the heart, not always related to exercise or exertion, and occurring at rest or at night: a good appetite, no digestive troubles, but gradual loss in weight, weak-



ness, feeling of body warmth, susceptibility to heat and free perspiration.

There is another complaint that is of importance to me and that is what the patient complains of as loss of memory, but analysis should really be defined as loss of attention. The patient's driving nervousness causes her mental activity to run far in advance of her physical ability and she does not become cognizant of her physical activities at the time of the act. From the physical side the examination may be most unsatisfactory, because there may be no positive findings to explain the complaints of the individual.

It is very important to see a patient of this type at intervals to get cross-section of her activities before reaching a definite conclusion.

In over 50% of these cases there is no goitre or any enlargement of the thyroid present, and rarely are there bruits or thrills over the poles, or definite evidence of increased vascularity in the gland. The gland may be very small and firm.

It is a great mistake and one too often made in doubtful cases, to diagnose a condition as of hyperthyroidism as soon as the presence of an enlargement of the thyroid is discovered. Some of the most severe cases of hyperthyroidism are not associated with any appreciable enlargement of the thyroid, for if enlargement is to be of diagnostic significance, the gland must be hyperplastic in type, with increased vascularity palpable in the gland, which must be distinguished from the soft, colloid variety found in many neurotic young women.

Eye signs are usually variable in these cases. The most common finding is a stare, possibly with slight widening of the palpebral margins and increased glistening of the conjunctiva due to increased lacrimal secretion; slight lid lag may be present. One must differentiate such a stare from that of a frightened nervous woman with dilated pupils, which, after a few words of reassurance, disappears.

Hyperthyroidism is not as a rule present without a definite tachycardia. It is constant and persistent, does not diminish in rate to any great degree and does not fluctuate in range as much as in the excitable cases of neurosis. Heart sounds are usually forceful and valvular sounds are suggestive of more rapid filling and emptying of the heart.

The presence of tachycardia or even an elevation of blood pressure does not prove that hyperthyroidism is present. The pulse pressure is usually elevated or high and diastolic pressure usually remains normal or below normal.

Warm, moist, oily skin is usually present

and, associated with the other facts, is of importance.

The diagnostic importance of the basal metabolic rate has been over emphasized in this disease. Repeated estimations of the metabolism under truly basal conditions must be made before any significance can be attached to them, and then these should be considered only in conjunction with the physical findings and carefully studied history. The diagnosis of these cases can be settled by no single detail. Great care must be taken in metabolic tests to rule out technical errors.

A problem too frequently encountered, and most defiant of diagnosis is that presented by the patient who has been suspected of hyperthyroidism and previously treated with iodine. When the patient has been taking iodine for any length of time, some of the significant findings on which the diagnosis of hyperthyroidism is made will be masked or absent, and under such conditions, the diagnosis should be withheld until another remission of the disease. Iodine in the treatment of goitre should be used only in the prophylactic treatment of adolescent goitre, in preparation of toxic patients for operation for a period of not over thirty days, if the heart permits, during lactation in goiterous mothers and, in certain cases, at menopause.

Let us now present some of the conditions that are so commonly confused with the borderline hyperthyroidism and see how they contrast.

The most common condition which simulates borderline hyperthyroidism is neurocirculatory asthenia, or neurasthenia.

By careful study of the mental state of the patient helpful data can be accumulated. The pessimistic viewpoint of a constantly complaining individual whose many somatic ailments are out of proportion to all pathological or physiological association, differs so decidedly from the bubbling over optimism and the alert stimulated mentality of the hyperthyroid state, that the contrast is marked, and will alone aid greatly in the diagnosis. This depression, together with choking sensations, bands about the neck, constrictions and lumps in the throat, all imagined, together with manifold and continuous worries over imaginary states and a delight in the assumption of martyrdom, fall into line to further distinguish the neurotic, but, in the minds of many, such characteristics are frequently mistaken for hyperthyroidism. If a patient presents a healthy looking body and a long history of ill health, if she feels better in hot weather and is depressed in cold and consequently avoids cold climates, if she perspires very little, if any, has a very capricious appetite, and is always

constipated, the physician should at once be skeptical of the possibility of thyroid hypertunction.

"Fatigue neurosis" is another quite common condition that is mistaken for hyperthyroidism. This is best illustrated by a hypothetical history to picture such a case. A woman is married and has two or more children. All her life she has not been strong and has consequently been indulged. The financial or social status of her marriage has not exactly equalled her anticipation; responsibilities are too great, so, gradually, or abruptly, she becomes nervous and tired, develops varied complaints, notices rapidity of heart action, tremors, some loss in appetite, stomach troubles, weight loss and constipation. With her, a metabolism is not necessary to distinguish the neurasthenic state from hyperthyroidism.

Here you have social and economic, psychic and physical problems combined, and such a case is the most difficult to handle because of the lack of personal initiative, and the unwillingness, on the part of the patient, to face her problem squarely. You cannot cure one who does not want to get well.

One very confusing finding in the minds of many is that of a small thyroid enlargement. In these cases the diagnosis is quite difficult at times, but upon the repeated finding of normal or low metabolism, with the preponderance of the pessimistic symptoms of a neurotic individual, one in time should have little difficulty in diagnosing the condition.

Certain cases of organic heart disease or mitral stenosis frequently have symptoms which may simulate borderline hyperthyroidism. Shortness of breath, fatigueability, nervousness, and palpitation of the heart, being common symptoms are at times confusing but when there is present a true organic disease, and an absence of other indications of thyroid disturbance, such as moist skin, weight changes, subjective effect of heat, and the bright mental attitude, and, in addition, no physical findings in the gland itself, the diagnosis should not be difficult.

If hyperthyroidism should occur in such an exhausted condition it is very important to see that prompt relief is obtained to prevent subsequent cardiac damage.

Hypertension is commonly a confusing condition. Essential hypertension, hypertensive heart disease or cardio-renal hypertension may produce a so-called "nervousness," palpitation of the heart, slight elevation in basal metabolic rate and feeling of warmth of skin and moist skin. One must be most guarded in his decision in such cases, for it is only after a period of observation that a definite diagnosis can be

ascertained. Pulmonary tuberculosis, diabetes, pregnancy, and conditions producing prolonged low metabolism must all be ruled out in the diagnosis of borderline hyperthyroidism.

In the treatment of borderline hyperthyroidism the most important thing is to be sure of the *diagnosis*. It should be insisted that those patients who have been taking iodine, or who have had improvement with iodine, should be free from iodine medication for at least two-three months and then have a re-check of history, physical examination and basal metabolic rate. Insist on having her return to full activity to see if her mind can be relieved of any suspicion or fear of possible thyroid trouble, and if hyperthyroidism is actually present under such conditions it will readily re-appear.

We cannot have much help in the diagnosis if the patient continues with rest and sedatives. Until she proves definitely by her symptoms, examination and basal metabolic rate that mild hyperthyroidism is present, we do not recommend radical procedures. For in those cases that do not have mild hyperthyroidism present we have only unsatisfactory results and many consequent cases of myxoedema which are worse to treat than the original cases.

So we place the burden of proof on the patient to show by the results of her activity and absence of iodine that she really has hyperthyroidism, and until the diagnosis is unquestionable, surgery should be avoided. In these cases that have unquestionable mild or borderline hyperthyroidism, sub-total thyroidectomy is the treatment of choice. Patients who have mild hyperthyroidism, and are treated with rest in bed, limitation of activity and iodine, not only are not cured by this form of treatment, but the period of disability is markedly prolonged.

X-ray treatment has been used in a number of these cases for long periods of time, and we have seen patients under these circumstances whose basal metabolic rate has remained normal or below normal, and yet are still subject to the same group of symptoms as experienced before x-ray treatment. It is important to note here that there are many cases, not thyroid in origin, belonging, rather, in the neurotic group, which as we know will improve for a time with almost any form of treatment, and will relapse into their nervous state again when the treatment is discontinued. Also, similar cases erroneously diagnosed as hyperthyroid states have been psychically cured, and it is such recorded cases which give false data of cures obtained with x-ray treatment.

In cases of true hyperthyroidism where there is a physical change in the gland, only



after thyroidectomy is it possible for patients to be permanently relieved and return to a normal state of living. And may I state that it is not until the patient has had the proper amount of gland removed, proper pre- and post-operative treatment, a period of *at least* three months up-building and one year's observation to re-establish the proper endocrine and psychic adjustment and balance, that a permanent cure is obtained.

The technique of the operation in mild hyperthyroidism is no different from the severe thyroid cases, but it is technically more difficult because of the small size of the gland and the many possibilities of complications present.

Myxoedema following the operation in these cases is higher than in severe cases, but the treatment with thyroid extract is satisfactory. With sub-total thyroidectomy in these cases of *definite* mild hyperthyroidism, 85% cures can be expected, with a permanent lowered metabolism to within normal limits, and the patients return to their former occupations.

#### CONCLUSIONS

In the diagnosis in border line hyperthyroidism the burden of proof is on the patient and one must be certain in that diagnosis before operation is advocated.

(2) Sub-total thyroidectomy with post-operative care and follow up give 85% satisfactory results, and is definitely indicated in these cases of borderline hyperthyroidism.

(3) Post-operative myxoedema is high and only temporary in these cases, but it is well controlled by thyroid extract.

(4) Sub-total thyroidectomy should not be done on a case that does not have definite hyperthyroidism.

#### NEWS ITEMS

The next written examination of the American Board of Obstetrics and Gynecology will be held on Saturday, October 22, at 2 p. m., in 19 different cities of the United States and Canada. In order to reduce traveling expenses for candidates special arrangement may be made through the Secretary for taking the written examination at any city other than those regularly specified where there is a Diplomate who can be empowered to conduct the examination. This arrangement does not apply to the general, clinical examination.

The next general, oral and clinical examination, is to be held in conjunction with the meeting of the Pacific Coast Society of Obstetrics and Gynecology at Los Angeles, California, on December 7 provided there are sufficient applicants.

The only reduction in railroad fares that will be available will be possible seasonal or round trip special rates. Information regarding this should be obtained from any railroad agent.

The candidates will have the opportunity also of attending the scientific sessions of this Society, as the examination is scheduled for the day preceding the opening of the session.

Applications for these examinations should be filed immediately. Lists close for Group B applicants (see booklet) on October 5, and for Group A applicants on November 15.

For application blanks and other information, address Dr. Paul Titus, Secretary, 1015 Highland Building, Pittsburgh, Pennsylvania.

William J. Martin, Jr., M. D., announces the opening of offices. Practice limited to Surgery of the Anus and Rectum. Diagnosis of Colonic, Rectal and Anal Diseases. Office Hours: 8:00 to 1:00 and by appointment. 800-801 Brown Building, Louisville.

#### COUNTY SOCIETY REPORTS

Seventh District: The Seventh District Council Meeting was held in Crab Orchard Spring Hotel August 4. Dr. Virgil Kinnaid presiding, and the following present: Louis Frank, Wallace Frank, A. Hays Davis, F. P. Strickler, J. L. Jones, C. D. Enfield, L. H. South, Louisville; Nuri Zia, Stambul, Turkey; W. F. Lamb, Stanford; J. L. Phillips, Crab Orchard; T. J. Acton, Eubank; D. B. Southard, Stanford; W. H. Smith, Danville; J. B. Floyd, Richmond; J. S. Brown, Stanford; W. L. Crosby, Williamsburg; W. M. Dr. Dabney; R. W. Smith, Stearns; Walker Owen Jones, Mt. Vernon.

After a very excellent dinner of fried chicken and country ham, the meeting was held in the auditorium with the following program:

"Decurrent Dislocation of the Shoulder" (motion picture), F. P. Strickler, Louisville.

"Oxygen Therapy" (lantern slides), R. H. Davis, Louisville.

"Cancer of the Breast" (motion picture of living cancer cells), L. Wallace Frank and C. D. Enfield, Louisville.

VIRGIL KINNAID, Councilor.

**Franklin:** The regular monthly session of the Franklin County Medical Society was held Thursday, September 1st, in the Capital Hotel, this being the first meeting since June 2nd.

The President called the meeting to order. The minutes of the last meeting were read and approved. Members present: Drs. Patterson, Snyder, Travis, Martin, Coleman, Minish, Coblin, Ginn, Heilman, Jackson, Stewart, Demaree and Youmans.

Dr. L. T. Minish had charge of the program and was fortunate in securing Dr. W. O. Johnson, of Louisville, specialist, who gave a most interesting talk on "Goiter" which was enjoyed by all present.

C. E. YOUMANS, Secretary.

# Kentucky Medical Journal

Published Monthly By

THE KENTUCKY MEDICAL ASSOCIATION  
IncorporatedEntered as second class matter October 22, 1906, at  
the Postoffice at Bowling Green, Ky., under act of  
Congress, March 3, 1879.Subscription Price .....\$5.00  
Edited Under Supervision of the Council

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NEXT MEETING MURRAY

## ADDITIONAL COUNTY SOCIETY REPORTS

**Jefferson:** The following is the program for the November Meetings of the Jefferson County Medical Society:

### November 7th—Case Reports

Chronic Pancreatitis, W. O. Johnson, M. D.

Ruptured Duodenal Ulcer, J. Garland Sherrill, M. D.

### Essay

The Activities of the Department of Psychiatry and Mental Hygiene of the University of Louisville School of Medicine, S. S. Ackersly M. D.

### November 21st—Case Report

Birth Injuries, Henry M. Rubel, M. D.

### Symposium on The New-Born

Resuscitation, Nora D. Dean, M. D.

Hemorrhagic Diseases of the New-Born, Lee Palmer, M. D.

Intracranial Birth Injuries, James H. Pritchett, M. D.

Infections in the New-Born, Philip F. Barbour, M. D.

Discussion to be opened by Drs. W. W. Nicholson and Henry M. Rubel.

GUY AUD, President,

ULY H. SMITH, Secretary.

**Nelson:** The Nelson County Medical Society met at the City Hall, Bardstown, Wednesday, September 26 with the President, Dr. E. D. Mudd, New Haven, presiding.

The following were present: Dr. and Mrs. Shackette, Hodgenville; H. S. Harned, Boston; Dr. and Mrs. H. R. Wilbur, Lebanon; Dr. and Mrs. O. M. Crenshaw, Lebanon; Dr. and Mrs. J. I. Greenwell, New Haven; Drs. Jethra Hancock, A. E. Bell, S. C. McCoy, J. H. Pritchett, J. D. Allen, L. H. South, Irvin Abell, Winston Rutledge, Louisville; Dr. J. J. Wakefield, Bloomfield; Dr. G. G. Thorton, Lebanon; Dr. and Mrs. A. C. Overall, Lawrenceburg; Dr. and Mrs. A. D. Steely, Bardstown; Mrs. Henry L. Muir, Bardstown; R. H. Greenwell, Bardstown; Dr. J. D. Lilliard, Lawrenceburg; Dr. M. W. Hyatt, Miss Nellie Hyatt, Willisburg; W. E. Crume, Bardstown; Mrs. Irvin Abell, Louisville; J. B. Overall, and Roddie Hamilton, Springfield.

The following program was carried out:

Prenatal Syphilis, Winston Rutledge, M. D., Louisville. Discussion by Jethra Hancock, M. D., Louisville.

Sequellae of Scarlet Fever in the Otolaryngeal Field, A. E. Bell, M. D., Louisville.

Dinner 1 P. M.,—Old Kentucky Home Hotel.

Surgical Tuberculosis of the Kidney, S. C. McCoy, M. D., Louisville.

Treatment of Retro Displacement and Complete Relapse of the Uterus (Lantern Slides). Irvin Abell, M. D., Louisville.

Diphtheria Problems, J. H. Pritchett, M. D., Louisville.

RICHARD H. GREENWELL, Secretary.



# KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. 30 No. 12

BOWLING GREEN, KY.,

DECEMBER, 1932

## EDITORIAL

### TYPHOID VACCINATION

At the Washington meeting of the American Public Health Association, there were many discussions on the value of vaccination to prevent typhoid fever and numerous health departments were reporting many cases of typhoid fever occurring after vaccination, and were questioning the value of this procedure for preventing typhoid fever. There were many arguments regarding repeating the inoculations every year or increasing the dosage in an endeavor to secure better immunity. Many of the health officers seem to have forgotten that no amount of vaccine can avoid the results of an overwhelming and concentrated infection, and that vaccination is a temporary measure and that sanitation is permanent. In several of the Southern States where emphasis has been put on permanent sanitary improvements, especially in small towns, chief sources of the disease, reports show that the pandemic this year, caused no increase in the incidence of the disease.

The late Sir Andrew Balfour, who was Director of the London School of Hygiene and Tropical Medicine, gave the following as his opinion regarding the value of vaccination as a means of preventing typhoid and other enteric fevers: "There is a tendency, a growing tendency, to have recourse to preventive inoculation which proved its value in time of war. That it is an excellent preventive measure no one who has studied the subject with an unbiased mind will deny. That it is a valuable auxiliary in the campaign against typhoid fever, more especially in times of emergency, will be generally admitted, but it appears to us that it would be a pity were it to usurp first place in the line of defence. There is a distinct danger: that this may occur, and that thereby communities will be led to neglect their obvious duties in the way of providing cleanly surroundings and carrying out essential sanitary works. It is no doubt cheaper to pay bi-annually for three preventive doses of vaccine than to provide satisfactory sanitation. It is cheaper but not wiser in the long run. Typhoid fever is only one of several filth diseases, and if a community is to live happily and healthily, it must pay handsomely for those services which abolish filth and the ill results of filth. It is not a sound sanitary

policy to rely on a large scale upon a measure like preventive inoculation, if only because the enteric fevers cannot be divorced from other dangerous maladies against which an anti-typhoid vaccine conveys no protection, and because progress in sanitation is a most important factor in education and the physical, mental and moral improvement of mankind."

### CONGRATULATIONS ON A TWENTY-FIFTH ANNIVERSARY

Alluring advertisements and persuasive radio announcers daily bring before us the need for clean bodies, teeth protection, sunshine, plenty of refreshing sleep and nourishing food. But it was not ever thus. Twenty-five years ago the majority of men and women seldom read or heard about reasons why one should practice daily health habits. The first instrument to bring this need home to them was a tiny symbol. It was used as a medium to teach health education. It was the penny Christmas seal. Its twenty-fifth anniversary is this year. Congratulations!

Tuberculosis associations from the beginning have made health education one of their chief concerns. During the past twenty-five years their teachings have contained such slogans as: "Play in the sunshine." "Go to your doctor at least once a year," "Keep your body clean inside and out with plenty of water," "Brush your teeth twice a day," "A cold is nothing to sneeze about." These statements were backed by scientific reasons for obeying health laws. "By preventing tuberculosis we can eventually stamp it out." was the basic theory upon which they founded their nationwide health movement.

There is no question that today practically everybody—from the school child to the grandfather—has become health-conscious. Soap manufacturers, food producers, bathing suit makers, and many other business concerns have capitalized our health-consciousness. We are made aware of this fact every time we look through a magazine or turn on the radio. Far be it from the 2,084 State and local tuberculosis associations or their leader, the National Tuberculosis Association, to take undue credit for better health conditions that were bound to come with the march of progress. For their symbol of good health,

however, the gay little Christmas seal, they may justly be proud. Appealing to news-boy and banker alike, these holiday stickers have come to be the accepted "seals of health."

This year is the twenty-fifth anniversary of their use. In a comparatively short period of time they have helped to decrease the death rate from tuberculosis to less than one-half of what it was in 1907. On a twenty-fifth birthday a person is just standing on the threshold of productive life. Yet at that age period there are now more deaths from tuberculosis than for any other age period. For that reason the work must still go on and the little seals must be sold until we have this sickness as well controlled as smallpox. For research work, clinics, tuberculosis nurses, protective tests among children, the money must be raised. Such a good beginning must be followed by a good ending.

The Kentucky Tuberculosis Association was organized under the National association in 1911. In that year deaths from tuberculosis in the State totaled 5,293, the rate being 229.5 per 100,000 population. In 1930, the rate had dropped to 94.5 per 100,000 population, the aggregate deaths that year being 2,469. In 1931, the rate, after steadily declining for several years, took a slight upturn, the rate being 95.2 and the total number of deaths 2,474. While this increase is comparatively small, the significant fact is that the trend had changed from downward to upward, and this fact gathers additional significance from what it may reasonably be assumed to portend. The effects of economic depression on public health are bound to be cumulative. The influence of prolonged economic strain and stress upon tuberculosis mortality is only beginning definitely to manifest itself. From three to five years, assuming that the peak of the depression has been passed, will be required to show the full effects.

In such circumstances, there is a very definite threat of a steady increase in tuberculosis in Kentucky, unless extraordinary efforts are put forth to control the disease. To this end, every possible means should be used to locate and properly take care of cases of tuberculosis everywhere in the Commonwealth. Money for this purpose must come, if it is to come at all, largely from the sale of Christmas Seals.

Congratulations to the Christmas Seal on its twenty-fifth anniversary! And paradoxical as this birthday wish may sound—we hope it will not be necessary for the Seal to reach its fiftieth!

## MRS. WALTER JACKSON FREEMAN

Every one who was present at the recent sessions of the Kentucky State Medical Association will remember the fine presence of Mrs. Walter Jackson Freeman, the President of the Woman's Auxiliary to the American Medical Association, and will share with us in sincere regret at her death of an acute illness which developed immediately following her return from Louisville.

Mrs. Freeman was finishing a tour of many states when she was in Louisville, but her seemingly tireless energy, confidence and vision and her fine conception of the opportunity presented by the developing organization which had honored her with its Presidency, was one of the most interesting events of the best medical meeting ever held in Kentucky.

Mrs. Freeman was the daughter of Doctor W. W. Keen, one of the world's greatest surgeons. He passed on recently, after almost arriving at the century mark. Her husband also preceded her to the Great Beyond, but she leaves behind two sons who will carry on the fine traditions of one of the great medical families of our country.

It was a great privilege to have this fine spirit amongst us and we join her sorrowing friends everywhere in acknowledging the joy she gave us while she was here, where she exemplified the real values in life by her charm and her wisdom.

## THE SUMMER ROUND-UP

At the recent meeting of the State Medical Association Doctor Minish brought to the attention of the profession the importance of the summer round-up of pre-school children that is being promoted by the Kentucky Congress of Parents and Teachers.

The success of this movement is, of course, dependent on thorough co-operation between parents, teachers and physicians. The idea is to get the public educated as to the value of securing the important immunizations and protections for child health at the proper time.

Thoughtful physicians are advising parents to bring their children in for vaccination at six months, diphtheria immunization at nine months, scarlet fever immunization during the third year and the beginning of the typhoid inoculations during the fifth year. The responsibility for these procedures should be definitely accepted by the family physician. He should call attention of the parents in his practice to the necessity of these procedures. At the time of such inoculations he will, of course, carefully examine the child and give such advice as is necessary to have it in the best possible condition during the pre-school



age so that it will be ready to enter school sound in mind and body. Where the physician has failed to do his duty to his families, the summer round-up is of tremendous importance in centering the attention of the heads of families to the necessity of these procedures.

It is very important for the profession to keep in mind that three-fourths of the deaths from diphtheria occur between the ninth month and the sixth year and these deaths are only going to be prevented if the immunizations are done at the proper time. People cannot know these things except as they are taught them by their doctors. In Kentucky the medical profession is especially grateful to the Parent-Teachers organizations for bringing the attention of the public to the important progress of scientific medicine.

### McCRACKEN COUNTY LEADS

One of the most important reports presented to the House of Delegates at the October, 1932 meeting was that of the Cancer Committee. Its suggestion that each county society have a symposium on cancer sometime during the coming year was enthusiastically endorsed by the delegates.

On November 7, the following letter was received from Dr. Leon Higdon, Secretary of McCracken County Society:

"Dear Doctor:

The McCracken County Medical Society meets November 23, and we wish to have a symposium on cancer. This program is to be presented by members of the Bernard Skin and Cancer Clinic of St. Louis. We also hope to have one of these guests give a lecture over radio station WPAD, provided this shall meet with the approval of the State Society, for the control of cancer.

Very truly yours,

Leon Higdon, M. D."

After consulting with Dr. Wallace Frank, Chairman of the Cancer Committee of the State Society we immediately wrote Dr. Leon Higdon not only approving his plan but also congratulating his society on leading the way. We are anxious to hear of similar plans by other county societies and are prepared to suggest men to appear on such programs if desired. Communications may be addressed to Dr. Wallace Frank, Heyburn Building, Dr. A. T. McCormack, or the undersigned.

J. Duffy Hancock, M. D.

State Chairman of the American Society for the Control of Cancer. 516 Brown Bldg., Louisville, Ky.

### A NEW BACTERIOLOGY

Regardless of what department of medicine a physician may use as a specialty, he will always have occasion to refer to a good book on Bacteriology. Almost every day new problems arise in this field that affect every branch of medicine and while the general practitioner and surgeon cannot be Bacteriologists, they should know how to evaluate reports and interpret laboratory results and be familiar with the progress this science is making. We recommend to our readers the new Sixth Edition of the Text Book of Bacteriology by Hans Zinsser, M. D., of Harvard University, published by D. Appleton & Company, New York. It is concise, easily readable, and not so technical that it can not be comprehended by those not familiar with the many new methods described. Many new and interesting chapters have been added in this new edition, as pertaining to pathogenic fungi and the investigations of Copenhagen commission on hemophilic bacteria associated with influenza and whooping cough.

It is a treatise on the application of Bacteriology and Immunology to the etiology, diagnosis, specific therapy and prevention of infectious diseases for students and practitioners of medicine and public health.

### THE KENTUCKY WHITE HOUSE CONFERENCE

The Kentucky White House Conference on Child Health and Protection, held in Lexington, October 28-29, was an outstanding meeting. The program presented was very complete, embracing the many various phases of child welfare work.

The Committee on Education discussed the educational needs of the child, beginning with the pre-school age, continuing with the problems of vocational and special classes and supplementing with character, physical and safety education.

The Committee on Medical Welfare emphasized, first of all, the value and importance of pre-natal care, not only to the mother, but to the coming child. With the baby well-born, periodic physical examinations at regular intervals, together with proper attention to diet, clothing and posture, bring the child in healthy condition to the school, where adequate control of communicable diseases lessens the gamut of childhood ills which our children must run. Especially important is the recognition of tuberculosis as a large factor in the underweight, undeveloped child. Comprehension of the psychology of the child is assuming larger and larger proportions in our study of child needs.

Dr. Martha Eliot of the Federal Children's Bureau, Washington, gave a detailed study of food values and needs for the growing child.

At the Dinner Meeting very forceful addresses were delivered by Governor Laffoon; State Superintendent of Public Instruction, James H. Richmond; State Health Officer, Dr. A. T. McCormack; Dr. H. E. Barnard, National Director, White House Conference, Washington; and Miss Katherine Tucker, Director of the National Organization for Public Health Nursing.

The report of the Committee on Social Welfare was especially varied and constructive. The social relations of the child are assuming greater and greater importance in proportion as we are coming to realize more fully the duty and responsibility of the State and of Society to children. The dependent child will constitute a particular civic challenge in the next few months, though the problem is necessarily one that will continue, in greater or less measure, always to abide with us.

Kentucky has been outstanding in its efforts in behalf of the defective child. The School for the Blind at Louisville and the School for the Deaf and Dumb at Danville were among the first of such institutions to be established in the United States. The work of the Crippled Children's Commission needs to be mentioned only to be applauded. We shall need much thought for a better plan for handling the delinquent child in Kentucky, though our social workers have a fine vision.

A great piece of preliminary work has been done. It now remains for all of us to unite in the high endeavor to carry home to every community in the State the reports of the various committees and translate their findings into action. In no other single way can we better insure the health and happiness of our children and so promote the well-being and prosperity of the Commonwealth.

PHILIP F. BARBOUR

#### TO BE SAFE FROM TULAREMIA

The following precautions should be rigidly observed by hunters, market men, housewives and others who handle wild rabbits if they would be absolutely safe from tularemia, or rabbit fever:

1. Never put your unprotected hands inside a wild rabbit.
2. Always wear rubber gloves when handling wild rabbits.
3. The rabbit must be thoroughly cooked; so well cooked that there is no red meat, nor any red juice, near the bone.
4. As at least 1 per cent of all wild rabbits are infected, the hunter, to be perfectly assured of safety, should not take home a wild rabbit that he shoots in the field if it seems sickly.
5. In order to minimize possible infection, rabbits which seem slow or sickly, or can be run down and killed with a club, should be

#### SCIENTIFIC EDITORIAL

##### THE TREATMENT OF PNEUMONIA

In the treatment of pneumonia, we are dealing with a violent infection usually rapid in its course and often tending to a fatal termination. It should therefore, be recognized early, and no step should be left unturned to give the patient a better chance to resist the infection.

There are two important factors which lead to fatality. The symptom complex known as anoxemia, where there is an actual want of oxygen in the combining power of the blood and the severe toxemia from the infection. Each one of these factors has its important group of symptoms, and, naturally, each one tends to increase the other.

As soon as the diagnosis is made or pneumonia is suspected the patient should be placed in an oxygen atmosphere. With the modern tent that is available today, the percentage of oxygen can be perfectly regulated and kept constant. This will vary according to the severity of the case and the needs of the individual. With a mild case 35 to 40% may be sufficient. As the severity increases the percentage of oxygen in the atmosphere should be raised, and, in the very severe cases, 55 to 60% may be needed, but it is not advisable to increase it above 60%. The percentage necessary is easily determined by the condition of the patient. The oxygen treatment should be continued for about 24 hours after the crisis, and then it should be removed gradually, carefully watching the effect, and immediately replaced if necessary. In this manner the patient will soon be able to do without it.

With the anoxemia out of the way, the other treatment may be directed towards combating the toxin, and, in doing this, every effort should be used to save the strength and the circulation until the resisting power can overcome the infection.

The patient should be kept absolutely in bed and not permitted to make any undue exertion. He should be kept quiet, and the cough controlled by opiates. There is no sedative as safe in a pneumonia case as opium. Codeine may be given during the day in half grain doses sufficiently often to keep the patient quiet and a hypodermic of morphine at night.

The diet is important and should be of a nature to combat acidosis and prevent abdominal distension, as tympanities is a serious symptom in pneumonia, embarrassing the already laboring heart and the respiration. The disease is of short duration and the quantity of food is usually not important, if sufficient carbohydrates are given to prevent acidosis. A good diet, especially in severe cases, is to



have the patient drink at frequent intervals an orangeade made of 10% glucose, with sufficient orange juice to make it palatable. Whiskey acts as a food and should always be given if the patient is accustomed to its use. Other very simple foods should be used with great caution. Fluids should of course be given freely but the orangeade just mentioned in sufficient quantity also accomplishes this purpose.

The bowels should be moved once daily, preferably by enemas, as purgation is weakening.

It will often be found necessary to use stimulants to support the heart and circulation. For years Digitalis has been highly favored, but the tendency of belief today is that Digitalis in pneumonia does more harm than good. It is questionable if it should ever be used but, if so, the dose should never be greater than one-half the digitalizing quantity. Of all the stimulants to the circulation Glucose intravenously is the best. This may be given two to four times during the 24 hours or even oftener if the circulation is failing. Caffeine and Sodium Benzoate is also good when necessary, and, in emergencies, Camphor in Oil may be used. If there is a tendency to edema, atropine is the best drug for its drying effect.

I have left the specific treatment of pneumonia until last because I want to discuss this in some detail. In the beginning, there is a tendency today in certain cases to give a combined pneumococcus vaccine daily for two or three doses. The immunizing bodies do not appear until five days after the first injections, but this may be of value in preventing spreading of the consolidation which is most dangerous later in the disease. The use of antipneumococcic serum is of unquestionable real value. There are many cases on record where the injection of the serum has very quickly changed a positive blood stream infection into a negative one. A blood culture is always of great value, not only from a prognostic standpoint, but from the standpoint of advisable treatment. In order to consider the serum treatment the pneumococcus must be typed. This is done by injecting the sputum into the peritoneal cavity of white mice and testing out the peritoneal exudate with the specific sera. If the case belongs to Type I, the serum is of very great value. In Type II, it is of value, but of less value than in Type I. In Type III it is useless, and in Type IV there is no serum. If the serum is used it should be given intravenously, preceded by an eye test for sensitization. The physician should inject it very slowly and should remain with the patient for one-half hour afterwards, ready to administer adrenalin at once if a reaction appears. It

is necessary to give 100,000 units during the twenty-four hours to get the effect. The first dose may be 10,000 units and subsequent doses 20,000 units, given at about four-hour intervals. The greatest care should always be used to prevent severe reactions, as pneumonia patients have already all to combat that their resistance will stand. The serum, however, if used properly and scientifically is a great aid in the treatment of Type I and Type II pneumonia, but I do not believe that it should be used as a routine in all of these cases. The cases should be chosen that have a positive blood stream infection or that show a tendency to be severe or to spread.

R. HAYES DAVIS.

### OFFICIAL ANNOUNCEMENTS

MINUTES OF THE EIGHTY-SECOND ANNUAL  
SCIENTIFIC SESSION OF THE KENTUCKY  
STATE MEDICAL ASSOCIATION, HELD  
AT LOUISVILLE

OCTOBER 4-6, 1932

#### FIRST SCIENTIFIC SESSION

TUESDAY MORNING, OCTOBER 4, 1932

The opening session of the Eighty-Second Annual Meeting of the Kentucky State Medical Association, held in the Roof Garden of the Hotel Brown, Louisville, October 4-6, 1932, was called to order at 9:15 o'clock, J. T. Reddick, Paducah, President of the Association, presiding.

PRESIDENT REDDICK: The Kentucky State Medical Association will now be in order. Will you please stand reverently and hear the invocation by Dr. Teunis E. Gouwens, Pastor of the Second Presbyterian Church.

REV. TEUNIS E. GOUWENS: Eternal God, our Father in Heaven, we pause in Thy presence as we open this meeting to seek Thy blessing. Thy servants have gathered here from various parts of our state and land to share with each other their experience and their wisdom and to equip themselves further for the great work to which Thou hast called them.

Bless them in their fellowship and enrich them, we beseech Thee, for the benefits of mutual exchange of ideas. Bless him who lays down the presidency of this organization and him who takes it up. Bless all who shall contribute to these meetings. May the information and the inspiration imparted and received here further fit Thy servants to go about healing and preventing diseases and being a benediction to mankind. May all that is undertaken here have the sanction and support of the Great Physician. And Thine shall be the praise and the glory forever, world without end. Amen.

PRESIDENT REDDICK: In the absence of

Honorable William B. Harrison, the Mayor of Louisville, we will now be favored with the address of welcome by Dr. C. H. Harris, of this city.

#### ADDRESS OF WELCOME

C. H. HARRIS, Louisville: Mr. President, Mr. President-Elect, Ladies and Gentlemen of the Kentucky State Medical Association: The Mayor has delegated me to say a few words of welcome to this Society because of his inability to be present, and so in his name and on behalf of the other executive officers of this city, I bid you greeting and a very hearty welcome to this great and beautiful city.

We usually stop there and say that we hope that your deliberations will be profitable and your stay pleasant, but I am going to change that a little and advise you to strictly obey the mandates of the Eighteenth Amendment while in the City of Louisville. Drink nothing from a bottle, and if you do be sure you do not do it in the presence of a policeman or a deputy sheriff because he will take it away from you and drink it himself. (Laughter).

I had the very great pleasure Sunday evening of attending the meeting of the Warren Memorial Church, Fourth and Broadway, and hearing the masterly address of Dr. Howard Kelly, and I want to say to this Association that if nothing else came out of this meeting other than that splendid and wonderful address by Dr. Kelly, your meeting has been worth while.

Dr. Howard Kelly, now grown old in the profession, being seventy-five, having received all of the honors, nearly, that could be bestowed upon a brother doctor, yet had the courageousness to stand up in a Christian pulpit and defend the principles of the Christian religion. He made a most wonderful statement there, that if all the scientific volumes of the world could be housed in one great room and the Holy Bible in another room alone, the Bible would outweigh and overshadow all the rest of the volumes in the world. That is a wonderful statement, and I felt like giving a great big Methodist shout when I heard Dr. Kelly say that.

In this day when the ultra-scientific teacher is disposed to get away from the principles of the Christian religion in our colleges, what a wonderful thing it is to have an outstanding man come forward and defend it. It is one of the best things that ever has occurred in this city.

I know it is wrong to refer to self; it violates the ethics somewhat, but gentlemen, I have had forty-one years experience in the practice of medicine in this city, and I want to tell you that the older I grow and as I approach further and further into the after-

noon of life, I rely more and more upon the Great Physician and His teachings. I think every true doctor would do that. What boots it if we do not understand everything that is in the Bible? The whale swallowed Jonah. We know that the whales that we see today couldn't swallow a chicken. Yet God made the whale, and why couldn't He make a whale to swallow Jonah and all the parlor furniture and everything else. I accept everything that I do not understand in blind faith, absolutely and positively, and I exact no bond nor surety from my heavenly Father that He will fulfill the promise that He has given me. All I want to do is to ring true to the duty and obligations that are upon me, and I start every day with a prayer and I end every day with a prayer. In the morning I ask God's guidance to help me deal with the perplexities and problems of the day; at night I thank Him for what He did for me that day. I hope as I grow older and come to the end of the journey, I may be able to say with the greatest of all creatures: The day of my departure is at hand, I have fought a good fight, I have finished my course and kept the faith. Henceforth there is laid up for me a crown of righteousness which He has preserved for me against that day, and not only for me, but for all those who love Him. (Applause).

PRESIDENT REDDICK: We will now have response to the address of welcome so splendidly given by Dr. Harris. The response will be given by Dr. John W. Scott of Lexington.

#### RESPONSE TO ADDRESS OF WELCOME

JOHN W. SCOTT, Lexington: Dr. Harris, Mr. President, Ladies and Gentlemen: Unaccustomed as I am to public speaking, as you all know, it seems to be almost an unfair advantage to take of me, having thought out some words to say in response to your distinguished Mayor, to find another gentleman here, equally distinguished, but a physician, who is giving us a welcome.

I am profoundly impressed by the great impression which Dr. Kelly's speech on Sunday night made on Dr. Harris. I regret that I did not come at least a day sooner. I think perhaps if Dr. Harris had heard one more such address he might even have left out his apostrophe to Bacchus which began his address of welcome.

But to respond to the welcome, we always like to come to Louisville. There are many attractions in Louisville. Unfortunately they do not seem to be confined to what goes on in this hall. Many of the men find a great deal of entertainment in an extra-curricular fashion, so to speak, but there is much here to attract us. To many of our members it is alma mater, the place where they received



their training in medicine, and all together it is a delightful thing to come to Louisville.

After all, though, the pleasantest thing is that old friends are giving us a warm welcome. (Applause).

PRESIDENT REDDICK: Members of the Kentucky State Medical Association, Guests, Ladies and Gentlemen: This meeting today marks another milestone, the eighty-second, in the history of the Kentucky State Medical Association, a history replete with much that is best in medicine and surgery in all the world. Today also marks the induction into office as President of this Association of one who has during his many years of service to the medical profession as teacher, writer, specialist in that great department of pediatrics, won the favor of this Association. Not only has his wisdom and learning been sought in his own state association, but also in the greatest medical associations of our country.

And now, Dr. Barbour, I invest you with the badge of your office as President of this Association and present to you our gavel, emblem of authority, and it is my desire and wish that you receive the same pleasure in presiding over the deliberations of this fine body of Kentucky physicians that I have had and also the same respectful regard.

Ladies and Gentlemen, it is my great pleasure to present Dr. Barbour, President of the Kentucky State Medical Association. (Applause).

PHILIP F. BARBOUR, Louisville: Dr. Reddick, my friends: It is impossible for me to find the words to express my appreciation of the great honor that you have conferred upon me. It is the greatest honor that a Kentucky doctor can receive.

I feel a great responsibility in accepting this position, because we all sense that there are subtle movements that foreshadow a great change in the next few years in the sociologic and economic conditions that surround us. We shall need from you keen foresight and very intelligent co-operation to meet the new conditions which lie before us. I think all of us doctors sense those changes which we cannot as yet understand, but we shall have to meet some day. I know that this Kentucky State Medical Association will meet that situation as it ought to be met.

Now, Dr. Reddick, since we are quoting the Bible this morning I want to quote old Elisha: I crave a double portion of the grace and dignity with which you have presided over this organization. (Applause).

Philip F. Barbour took the Chair.

SECRETARY MCCORMACK: Mr. President, I just noted the arrival in the room of the member of our profession who has longest served it in an official position. There is no other man more beloved by the profession

in Kentucky and whom we more delight to honor. I would move you that Dr. Gardner and Dr. Estill be appointed a committee to escort Dr. W. B. McClure, the lifetime honorary treasurer of this Association, elected last year, to the rostrum that he may sit in the chair that for the last twenty-seven years he has occupied, and may again give us the pleasure of demonstrating our affection and esteem for him.

PRESIDENT BARBOUR: Gentlemen, I take it that it is not necessary to say anything, that you fully agree with Dr. McCormack.

W. E. Gardner and Julian Estill escorted W. B. McClure, of Lexington, to the rostrum. (Applause).

W. B. MCCLURE, Lexington: I want to say that I know of no reason why I should be thus honored. I assure you that I do not realize that I have done anything to merit such distinction and manifestation of esteem, and, may I say, of love, on the part of my fellow doctors in Kentucky. However, I most heartily thank you for this distinguished honor.

PRESIDENT BARBOUR: We will now have a report from Dr. Aud, Chairman of the Committee on Arrangements.

GUY AUD, Louisville: There will be a public meeting at eight o'clock tonight in the Crystal Ballroom of the Brown Hotel. The program consists of the President's address, by Philip F. Barbour, and the annual oration by John Lovett Morse of Boston, President of the American Society of Pediatricians.

There will be a subscription banquet in the Crystal Ballroom of this hotel on Wednesday evening, at six-thirty. The guest speaker will be Dr. Ira B. Hiscock, of Yale University. Your wives and friends are invited.

The annual luncheon of the ladies of the Auxiliary as guests of the Kentucky State Medical Association will be held at twelve-thirty Wednesday in the Crystal Ballroom of the Brown Hotel. The luncheon will be in honor of Mrs. Walter Jackson Freeman, of Philadelphia, President of the American Medical Association Auxiliary, and Mrs. Charles E. Oates, Little Rock, President of the Southern Medical Association Auxiliary.

The Golf Committee announces that the annual golf tournament will be held at the Louisville Country Club. Playing privileges will be granted at any of the golf clubs by presenting your membership card or official badge of the Kentucky State Medical Association. Trophies will be given for the low gross and low net. To be eligible for low net your club handicap is necessary. A kicker's handicap tournament will be held where everyone is eligible. A trophy will be given for each of two lucky numbers. Players may turn in scores from last Saturday through Wednesday. Results will be announced and

trophies presented at the banquet on Wednesday evening. Ask any member of the golf committee for information.

The automobile committee has arranged with Mrs. Adams of the Auxiliary to supply automobiles as desired.

In behalf of the Jefferson County Medical Society I want to say that we are always glad to have you here. We want you to feel free to call upon us at all times, and if there is anything we can do to make your stay here more profitable and pleasant, we hope you will call on us, because we will be glad to do anything we can for you.

SECRETARY McCORMACK: Tonight, following the public meeting, Dr. Virgil Simpson will have an informal reception for the members at the French Village.

PRESIDENT BARBOUR: Gentlemen, we shall proceed now with the regular scientific session.

The following papers were presented:

Acute Gall Bladder Disease, by W. H. Smith, Danville; discussed by Walter I. Hume, Louisville; I. J. Hoover, Owensboro; Leon L. Solomon, Louisville; closing discussion by W. H. Smith.

Relative Value and Dangers of Spinal and Inhalation Anesthesias, by Uly H. Smith, Louisville; discussed by John W. Heim, Louisville; W. Hamilton Long, Louisville; M. A. Gilmore, Hopkinsville; E. M. Ewers, Somerset; A. D. Willmoth, Louisville; J. G. Sherrill, Louisville; R. L. McCormack, Louisville; closing discussion by Uly H. Smith.

The Treatment of Compound Fractures, by C. R. Petty, Lynch; discussed by Orville Miller, Louisville; F. P. Strickler, Louisville; D. Y. Graves, Bowling Green; I. A. Arnold, Louisville; George A. Hendon, Louisville; closing discussion by C. R. Petty.

Treatment of Generalized Infection by Blood Transfusions, by W. I. Hume, Louisville; discussed by E. Owsley Grant, Louisville; J. H. Pritchett, Louisville; George A. Hendon, Louisville; C. C. Howard, Glasgow; closing discussion by W. I. Hume.

The Oration in Surgery. The Epileptic Problem, was delivered by R. Glen Spurling, Louisville.

The meeting adjourned at twelve forty-five o'clock.

## SECOND SCIENTIFIC SESSION

TUESDAY AFTERNOON, OCTOBER 4, 1932

The Second Scientific Session was called to order at 2:10 p. m., Tuesday, October 4, by President Barbour.

The following papers were presented:

Stricture of the Female Urethra, by W. T. Briggs, Lexington; discussed by H. J. Farbach, Louisville; E. Owsley Grant, Louisville; C. G. Hoffman, Louisville; S. C. McCoy, Louisville; closing discussion by W. T. Briggs.

Relief of Prostatic Obstruction through the Urethra, by E. Owsley Grant, Louisville; discussed by W. T. Briggs, Lexington; S. C. McCoy, Louisville; R. C. Burrow, Cunningham; C. G. Hoffman, Louisville; Arthur T. McCormack, Louisville; closing discussion by E. Owsley Grant, Louisville.

Abscess of the Lung and Its Treatment, by Oscar O. Miller, Louisville; discussed by M. J. Alexander, Louisville; Paul A. Turner, Louisville; Gaylord C. Hall, Louisville; closing discussion by Oscar O. Miller.

Diverticulitis, of the Cecum, with Report of a Case, by Joseph M. Frehling, Louisville; discussed by Irvin Abell, Louisville; C. W. Dowden, Louisville; closing discussion by Joseph M. Frehling.

The meeting adjourned at four-thirty o'clock.

## PUBLIC MEETING

TUESDAY EVENING, OCTOBER 4, 1932

The Public Meeting was called to order at 8:10 p. m., C. R. Petty, Lynch, Vice-President, presiding.

CHAIRMAN LYNCH: I know of nothing that would give me greater pleasure or keener delight than to have the privilege of introducing to you the first speaker of the evening. I know of no man connected with the University of Louisville who has endeared himself to more students and planted in them higher ideals in the practice of the profession of medicine than Dr. Philip F. Barbour, President of the Kentucky State Medical Association. (Applause).

PRESIDENT PHILIP F. BARBOUR: Mr. Chairman, Members of the Kentucky State Medical Association, Ladies and Gentlemen. In casting about for a subject to talk to you upon tonight I thought that perhaps it would be well to have a little different viewpoint. So many times we doctors have talked to you about what the medical profession is doing for the people in general. Acting on Mr. Einstein's practice, I thought it might be well to see not what we do for other people, but what medicine really does to us as doctors.

President Barbour read his address, Why A Doctor. (Applause).

PRESIDENT BARBOUR: I spoke to Dr. McCormack about getting a physician to speak to us as our guest. He suggested that I get some outstanding pediatricist because the pediatricists had not had the recognition heretofore in our state. So in looking over the list of pediatricists in this country, I thought I would send for the King Bee. I therefore wrote to Dr. John Lovett Morse, who is the President of the American Academy of Pediatricians, formerly the head of the Department of Pediatrics in Harvard Medical School, and a man who is beloved and admired and respected as a smart doctor all over the country.



I have the pleasure tonight of introducing and presenting to you Dr. John Lovett Morse, of Boston. (Applause).

JOHN LOVETT MORSE: It is always very awkward for a speaker to be introduced as I have been introduced tonight. I should like to say just as nice things about Dr. Barbour, but unfortunately we don't do those things so well in New England as you do here, so I won't try. I think I can say, though, that if you hadn't wanted me you wouldn't have asked me and if I hadn't wanted to come I wouldn't be here. (Laughter).

John Lovett Morse read his address.

SECRETARY McCORMACK: Mr. President, I know every member of this Association and our guests as well as the members of the Auxiliary, who are really members as ourselves, have been very much enlightened and stimulated to thought by these two great addresses that we have heard tonight, and I know every one of us here takes pride in the proceedings of this Association which have been brought forth so wonderfully on this occasion.

Since our last session together, the limited roll of honorary life members of this Association has been deprived of one of its illustrious names, the late lamented Dr. Frank Billings. We have had the privilege of having him address us on several occasions at past meetings of this sort. Since this leaves a vacancy in the list of our honorary life members, I should like to move you, Mr. President, that this Association honor itself and honor medicine by electing Dr. John Lovett Morse of Boston as an honorary life member of the Kentucky State Medical Association, that we may have the privilege of recalling him from time to time and that we may have his sound advice in the important progress that we propose to make in the practice of medicine in the Commonwealth of Kentucky.

I know Dr. Morse will be glad to know that in facing this Association he faces not the ordinary medical society; he faces a group on whom the Commonwealth of Kentucky as organized has placed the responsibility for the practice of medicine and the prevention of disease and the prolongation of life within the confines of this state. This group of medical men are not merely critical of those who are performing public service, but they themselves are every one charged by law with public service, and it is our responsibility, our proud responsibility, that every life that comes into being in the Commonwealth of Kentucky comes within our domain and within our jurisdiction by law, and we are responsible that every safeguard and every care that modern science knows shall be thrown around them. It ill behooves any one of us that there may be any practical progress in the practice of our art or of our profession that we do not acquaint ourselves with and

make available to those who are dependent upon us for it.

In Kentucky we practice state medicine all the time and always have, and every one of us practices it for the benefit of the individuals for whom we practice. We practice it under a system that we have devised ourselves and that has been recognized by our lawmakers as the best that can be devised for the protection and care of individuals either well or sick within our jurisdiction.

I think it is important for our attention to be called by such distinguished leaders of scientific thought as this man tonight has done in his plain, simple language that every one of us has understood, that has been a challenge to everything that is best in us to devote ourselves better and better to the profession which gives the greatest opportunity for service that is given by any human organization, and that we may go from this hall tonight pledged again and again to do better and better work for the people we love to serve and the state of which we are proud to be citizens.

PRESIDENT BARBOUR: You have heard Dr. McCormack's motion that Dr. John Lovett Morse be made an honorary life member of our Association. All of those who are in favor will please stand.

Upon motion of Arthur T. McCormack, Louisville, unanimously carried, John Lovett Morse was elected to Honorary Life Membership in the Kentucky State Medical Association.

The meeting adjourned at nine-twenty o'clock.

### THIRD SCIENTIFIC SESSION

WEDNESDAY MORNING, OCTOBER 5, 1932

The Third Scientific Session was called to order at 9:00 a. m., Wednesday, October 5, by President Barbour.

The following case reports were presented:

Carotinemia or Xanthosis, by Winston U. Rutledge, Louisville; discussed by Arthur T. McCormack, Louisville; Leon L. Solomon, Louisville; Lillian H. South, Louisville; closing discussion by Winston U. Rutledge.

Bronchiectasis, by James W. Scudder, Liberty; discussed by Paul A. Turner, Louisville; B. S. Rutherford, Bowling Green; Leon L. Solomon, Louisville; closing discussion by James W. Scudder.

Leprosy in Kentucky, by Lillian H. South, Louisville; discussed by Winston U. Rutledge, Louisville; A. Sargent, Hopkinsville; Smithfield Keffer, Grayson; Leon L. Solomon, Louisville; closing discussion by L. H. South.

The following papers were presented:

Diagnosis and Treatment of Empyema of Childhood, by Clark Bailey, Harlan; discussed by Philip F. Barbour, Louisville; Hart Hagan, Louisville; Arthur T. McCormack,

Louisville; B. S. Rutherford, Bowling Green; J. Duffy Hancock, Louisville; R. C. Burrow, Cunningham; A. Sargent, Hopkinsville; closing discussion by Clark Bailey.

Malpractice Suits, by J. B. Lukins, Louisville; discussed by Arthur T. McCormack, Louisville; A. D. Willmoth, Louisville; George P. Sprague, Lexington; B. S. Rutherford, Bowling Green; Leon L. Solomon, Louisville; J. N. Bailey, Paducah; P. D. Gillim, Owensboro; Lee C. Redmon, Lexington; G. G. Thornton, Lebanon; C. A. Vance, Lexington; William E. Fallis, Louisville; Mr. L. R. Curtis, Louisville; closing discussion by J. B. Lukins.

Eczema, by Robert L. Kelly, Louisville; discussed by C. Brooks Willmott, Louisville.

In a Symposium on Anemias, the following papers were presented: Diagnosis and Treatment of (a) Agranulocytosis, by Carl H. Fortune, Lexington; discussed by Morris Flexner, Louisville; George A. Hendon, Louisville; Louis Frank, Louisville; Rowan Morrison, Louisville; closing discussion by Carl H. Fortune. (b) Lymphatic Leukemia, by T. J. Marshall, Paducah, and (c) Indications in Anemia for Surgery of the Spleen, by Austin R. Quigley, Maysville; discussed by W. E. Fallis, Louisville; Louis Frank, Louisville.

The Oration in Medicine, Chronic Hypochromic Anemia, was delivered by Charles N. Kavanaugh, Lexington.

The meeting adjourned at 1:10 o'clock.

#### FOURTH SCIENTIFIC SESSION

WEDNESDAY AFTERNOON, OCTOBER 5, 1932

The Fourth Scientific Session was called to order at 2:00 p. m., Wednesday, October 5, President Barbour, presiding.

The following papers were presented:

Allergy, by Armand E. Cohen, Louisville; Charles N. Kavanaugh, Lexington; Hugh R. Leavell, Louisville; Winston U. Rutledge, Louisville; G. G. Thornton, Lebanon; Leon L. Solomon, Louisville; Philip F. Barbour, Louisville; closing discussion by Armand E. Cohen.

Calcium Metabolism in Health and Disease, by F. Winter, Louisville; discussed by George A. Hendon, Louisville; Morris Flexner, Louisville; Henry M. Rubel, Louisville; C. E. Wakerlin, Louisville; A. Sargent, Hopkinsville; C. W. Dowden, Louisville; J. A. Orr, Paris; closing discussion by James E. Winter.

Relation of Ear, Nose and Throat to General Infectious Disease, by A. L. Bass, Louisville; discussed by Gaylord C. Hall, Louisville; closing discussion by A. L. Bass.

In a Symposium on Obstetrics, the following papers were read: (a) Complications of Pregnancy, Early and Late Hemorrhages, by Lee C. Redmon, Lexington; (b) Labor and Its

Complications, by B. S. Rutherford, Bowling Green; (c) The Puerperium and Its Complications, by N. C. Witt, Franklin (read by Henry M. Rubel, Louisville); discussed by Edward Speidel, Louisville; J. T. Reddick, Paducah; Smithfield Keffer, Grayson; J. B. Lukins, Louisville; B. J. Lammers, Louisville; J. B. Stroud, Louisville; S. P. Oldham, Owensboro; E. A. Stevens, Mayfield; Oscar L. Barnes, Hopkinsville; H. L. Read, Louisville; Henry M. Rubel, Louisville; W. N. Bailey, White Plains; S. J. Smock, LaGrange; closing discussion by L. C. Redmon and B. S. Rutherford.

The meeting adjourned at 4:30 o'clock.

#### SUBSCRIPTION DINNER

WEDNESDAY EVENING, OCTOBER 5, 1932

A subscription dinner for the members of the Association, their wives, friends and guests, held in the Crystal Ballroom of the Hotel Brown at 6:30 on Wednesday evening, was presided over by the President Philip F. Barbour, Louisville.

PRESIDENT BARBOUR: The story is told about Dr. W. W. Keen that when he was walking along the street one day, he saw a man fall and break his leg. Dr. Keen was carrying an umbrella, which he used as a splint, set the man's leg and fixed it up and then accompanied the man to the hospital. A young interne came out to receive him, looked at the man's leg and said, "Who did this?"

Dr. Keen said that he had helped to do it.

The young fellow said, "That's a pretty good job." Whereupon Dr. Keen handed him his card, and the young interne proceeded to faint.

One of our honored guests tonight is a daughter of Dr. W. W. Keen. She tells me that this story is like the story of Mark Twain who read an obituary notice of himself and said that it was grossly exaggerated. She said that this thing did not happen to Dr. Keen, but that it might have.

I have the great pleasure of introducing to you Mrs. Freeman, who is the President of the Woman's Auxiliary of the American Medical Association. (Applause).

MRS. WALTER JACKSON FREEMAN: Mr. President, Madam President of the Kentucky State Auxiliary, Ladies and Gentlemen: I had a beautiful speech written, but after that nice informal introduction I am not going to read it. I just feel that I would like to talk to you a little bit instead of reading you a more formal address.

It is the greatest pleasure to me to come back here to Kentucky for the second time; I had the pleasure of being with you at the time of the Southern Medical Association two years ago, and it is very unusual that an Auxiliary member has an opportunity to come



twice to the same town. I happen to belong to forty different auxiliaries, and I have only a year, so you may know I actually have to leap around this country in order to visit as many as I can.

I suppose that most of you doctors know about the Auxiliary. You have a very wonderful and very active membership here in Kentucky. They have done some very remarkable pieces of work, but for the benefit of those who perhaps are not so familiar with it, I should like to tell you a few things about it.

In the practice of medicine, in teaching, in research work, there is no place for a lay worker, but the day that saw the birth of preventive medicine made the Auxiliary perfectly inevitable. The nearest lay worker to whom a doctor can turn usually draw on her Auxiliary duties with her wedding ring, and after years of experience with the telephone and the plate warmer she is ready to meet with the other wives and plan still further Auxiliary work.

Preventive medicine, as you all know, offers a great field for lay workers. Dr. Olin West has likened preventive medicine to building a wall on the brink of the precipice instead of sending an ambulance to the bottom. The medical profession must pick the site for the wall; they must trace its design; they must select its material, and they must superintend its construction, but any lay worker can be a hewer of wood and a drawer of water, a mixer of concrete or a layer of bricks. That is exactly what the Auxiliary is prepared to do when you gentlemen have decided about the wall; when you have made your plans you can safely leave it to us to do the building.

We prepare the way for the medical profession and we have a unique place in preventive medicine; we have our own special niche in organized medicine. Through our daily contacts with the medical profession we can follow the development of medical thought from its inception. A man comes home from a medical meeting or lays down his medical journal and says: "This is the most marvelous thing. Did you know that liver is a good thing in anemia? Here is this man who says he has had so many cases and has done this, that and the other, and he thinks he has proved it." Of course his wife is immediately interested. Here is little Johnny who has looked kind of white and she immediately proceeds with liver. You see, as it goes on through the weeks and the months and perhaps the years of building up this idea about liver, she hears of it at home. The same is true of diphtheria immunization, the Schick test, the other special features of preventive medicine. We hear them spoken of at home and they sort of grow up in our midst, so when you are ready to launch your cam-

paign for this, that or the other thing, we are ready to help you intelligently; we have heard of it all during these weeks and months, perhaps years; through our daily contacts, our daily social contacts with our friends, we have spoken of it; our membership in various other women's organizations will open doors to you which otherwise would be hermetically sealed.

A woman on the board of a club in Philadelphia, the oldest and most important woman's club in the city, said that there was a wonderful osteopath who had done her so much good and he wanted to present a course of lectures at that club—I think he was going to do it free. One of our important Auxiliary members was on that board, and she managed to get that resolution tabled. She went afterwards to this lady who had proposed it and said: "How can you suggest having a series of talks on medical subjects from a man who hasn't even a medical degree?"

"Well," the lady said, "he has helped me."

"He may have helped you, but do you feel that our club, the most important and the oldest in Philadelphia, can properly sponsor a series of medical talks by a man who hasn't even a degree?"

The resolution remained on the table and died and was interred, and that is exactly what the Auxiliary can do in every line of approach that we have to the public. It is a great responsibility for us, and if we step out of that particular niche there is no one else who can fill it.

You gentlemen are the ones, as I said, to decide where that wall is to be built, and we can't, we don't know enough, we don't want to know enough. I don't want to know all about it; I want to know what you would like to have us do. You know, we don't come in like Boadicea with scythes on our chariot wheels ready to plow our way into the medical association or over the general public. We are standing like Queen Esther. I don't know how many of you have recently read the book of Esther, but I can't sufficiently recommend to you a reperusal of it. When Esther wanted something done she fixed herself up, she went to the beauty parlor, she bought herself the most wonderful clothes, she gave the king a great feast, and then she stood and waited until the golden scepter was extended before she could do anything. That is precisely what the Auxiliary does. We are standing waiting, and until the golden scepter is extended by you we can't do one thing. You gentlemen must make the move.

It is a wonderful and fortunate thing that here in Kentucky the relations between your health department and your medical society and your Auxiliary are so friendly, so cordial, so co-operative. If you gentlemen will get together with the Auxiliary and decide what

you want done, you will find that every member of the Auxiliary is only too delighted to support you in every possible way.

When I was down in New Orleans at the meeting of the Auxiliary at the time of the American Medical Association meeting last May, I was invited out to dinner, and in the course of the evening the lady next to me said: "You know, Mrs. Freeman, you're a great talker."

Well, I didn't think I could have understood her. Of course, I couldn't plead guilty to any such thing as that, and I said, "I beg your pardon?" I thought the music and the noise might have made me misunderstand her.

She said, "Mrs. Freeman, you're a great talker."

I said, "What did you say?"

She said, "You know, you really do talk a great deal."

I said, "I'm afraid I shall have to admit it?"

She said, "There's one thing about you, Mrs. Freeman, you talk a great deal, but when you are on the platform you say what you have to say, and then you sit down." So now I will sit down. (Applause).

PRESIDENT BARBOUR: I am sure all of us men feel very much complimented to be elated with the gentleman, Mrs. Freeman, who extended a golden scepter. I haven't seen anything of that kind around here. (Laughter).

I feel very much like the devil did. You have all heard the story of the old colored preacher whom someone asked how he got his sermons up, whether he wrote them all out, and he said no he didn't write them out, that when he got up to preach he didn't know what he was going to say, and not even the devil knew what he was going to say. I haven't the faintest idea what our next speaker is going to talk about. I have something of a suspicion that he is going to advise some of our attenuated young folks to drink milk. I think possibly if there are any that are not perfect 36's here he may suggest to you to take a little milk and cream on the side.

I wonder how he would handle a case that I heard about the other day of a colored woman who was up before the judge. The judge said, "Mandy, how old are you?"

"Jedge, Ize forty-eight."

He looked at her and said, "What! A young woman like you?"

She said, "Jedge, Ize mistaken, mebbe; i doan know whedder dat's mah age or mah bus measure." (Laughter).

If he will teach us how to modify that milk so as to help Mandy out, I think he will have filled the bill admirably. I have had a very delightful time talking to him.

You know, Dr. Kelly has been here, and he

has been quoting the Bible to us, so I am going to show my knowledge of the Bible by making a quotation that the Queen of Sheba said about Solomon. She said she had been hearing about him with her ear but that the half of it had never been told.

I introduce to you Dr. Ira V. Hiscock, Professor of Public Health, School of Medicine, Yale University. (Applause).

IRA V. HISCOCK: Mr. President, Madam President of the Auxiliary, and Friends of Kentucky: That was a devil of a good introduction, and it has removed the necessity of my telling you any stories at this point, but I do want to express my appreciation of this opportunity to meet with you here, and I wish to pay tribute particularly to the pioneering work which your medical association has done in supporting your Board of Health and the work which your Auxiliary has done, because from the standpoint of preventive medicine, in which I am particularly interested, those activities have had significance far beyond the confines of your own state.

I particularly want to pay tribute to the work of your eminent State Health Officer, who incidentally or otherwise is national orator of our American Public Health Association and in his presence, the presence of one famed for his silver-tongued oratory, I am somewhat shy. I want to tell you that that leadership has meant a great deal to the country as well as to the State of Kentucky.

Ira V. Hiscock read his address.

PRESIDENT BARBOUR: The Kentucky State Medical Association appreciates very much the fine turn-out we have had tonight, and I am sure it has been a pleasure to the speakers to have such an attentive and attractive audience.

SECRETARY McCORMACK: The largest number of physicians from outside of Louisville are attending this meeting of any meeting the Association has held in the eighty-two years of its existence, and that is the largest meeting that has ever been held. I think that is a splendid tribute to the program that has been prepared by Dr. Barbour and Dr. Miller and to the spirit of Kentucky physicians in these trying times.

The session adjourned at 9:00 p. m.

#### FIFTH SCIENTIFIC SESSION

THURSDAY MORNING, OCTOBER 6, 1932

The Fifth Scientific Session, conducted by the University of Louisville, was called to order at 9:00 a. m., Thursday, October 6 by President Barbour.

The following papers were presented:

Radical Treatment of Joint Tuberculosis. by R. L. Woodard, Louisville; discussed by I. A. Arnold, Louisville; Ellis Duncan, Lou-



isville; Orville R. Miller, Louisville; closing discussion by R. L. Woodard.

Clinical instruction in Dermatology and Syphilology at the University of Louisville, by C. Brooks Wilmott, Louisville; discussed by Winston U. Rutledge, Louisville.

Studies on the Circulation, by J. M. Kinsman, Louisville; discussed by John Walker Moore, Louisville.

Clinical Progress in Obstetrics, by Edward Speidel, Louisville; discussed by Henry M. Rubel, Louisville; S. P. Oldham, Owensboro; closing discussion by Edward Speidel.

The Early Symptoms of Acute Polomyelitis, by John J. Moren, Louisville; discussed by Curran Pope, Louisville; Philip F. Barbour, Louisville; Lee Palmer, Louisville; closing discussion by John J. Moren.

Some Causes of Blindness, by Claude T. Wolfe, Louisville.

The Ano-Rectal Abscess, by Bernard Asman, Louisville; discussed by M. H. Puls-kamp, Louisville; Granville S. Hanes, Louisville; closing discussion by Bernard Asman.

Surgical Complications in Pneumonia, by L. Wallace Frank, Louisville.

Some Practical and Theoretical Points in Oxygen and Carbon Dioxide Therapy, by W. Hamilton Long, Louisville; discussed by John W. Heim, Louisville; Wallace Frank, Louisville; S. C. Frarkel, Louisville; closing discussion by W. Hamilton Long.

Varicose Veins of the Broad Ligament as Cause of Pelvic Discomfort, by Charles W. Hibbitt, Louisville.

Recent Developments in the Department of Psychiatry, by W. E. Gardner, Louisville; discussed by S. S. Ackerley, Louisville.

Recent Advances in Pediatrics, by James H. Pritchett, Louisville.

The Prognosis of Nasal Sinus Diseases by Walter Dean, Louisville.

The meeting adjourned sine die at 12:45 o'clock.

A. T. McCORMACK, Secretary.

**Celluloid Capsule for Measuring Venous Pressures.**—Krogh and his associates describe a celluloid capsule for the determination of venous pressures. This is easily made, and notches can be cut so that it will fit any arrangement of veins. It is cemented to the skin with collodion. When with high venous pressures the necessarily high intracapsular pressure would cause distortion of the skin and erroneous readings, the error can be avoided by the use of a counter-weighting clamp, also described. Such a counter-weight is usually needed for the measurement of venous pressures above 30 cm. water pressure.

MINUTES OF THE EIGHTY-SECOND ANNUAL  
SESSION OF THE HOUSE OF DELEGATES OF  
THE KENTUCKY STATE MEDICAL AS-  
SOCIATION HELD IN BROWN HOTEL,  
LOUISVILLE

October 3-6, 1932

MONDAY AFTERNOON, OCTOBER 3, 1932

The first session of the House of Delegates of the Eighty-Second Annual Meeting of the Kentucky State Medical Association, held at the Hotel Brown, Louisville, October 3-6, 1932, convened at 2:00 o'clock, the President, J. T. Reddick, Paducah, presiding.

PRESIDENT REDDICK: The House of Delegates of the Kentucky State Medical Association will now be in order. The first item on the program is the report of the Credentials Committee.

THE SECRETARY: Mr. President, in the absence of Dr. Pritchett, I have the report of the Committee, which consists of the roll with the credentials of the officers and members, and I move that the report of the Committee be made the official roll and that additional delegates be enrolled as their credentials are presented to the Committee.

The motion was seconded and carried.

PRESIDENT REDDICK: The Secretary will call the roll.

The Secretary called the roll.

THE SECRETARY: There is a quorum.

PRESIDENT REDDICK: A quorum being present the next order is the minutes of the 1931 meeting.

SMITHFIELD KEFFER, Grayson: I move that we dispense with the reading of the minutes of the last meeting.

The motion was seconded and unanimously carried.

PRESIDENT REDDICK: Next is the report on Scientific Work.

THE SECRETARY: In the absence of Dr. Philip F. Barbour, Chairman of the Committee on Scientific Work, I should like to present the program and move you that this be made the official program for the session. Dr. Barbour will probably want to make a supplemental report when he comes in.

The motion was seconded and unanimously carried.

THE SECRETARY: I should like to call the attention of the members to the fact that the adoption of that motion makes this the official program, and motions can only be made in the House of Delegates for the extension of time or for changes in the program, so it avoids the embarrassment to the President and to the members of asking that time be extended in the general session. It is important for all of us to remember that so we can back up the President in his rulings holding the essayists and others to exact com-

pliance with the program.

PHILIP F. BARBOUR, Louisville: The program is the report of the Committee on Scientific Work, and I think I have nothing supplemental to add.

I would like to take the time, however, if the Chair will permit me, to say that tonight after the meeting of the Jefferson County Society, Mrs. Barbour and I are going to hold a very informal reception at our house, and we want to invite the delegates, the visiting doctors, the local doctors, and especially their wives, to come out.

PRESIDENT REDDICK: Next on the program is the report on Arrangements, by Dr. Aud, President of the Jefferson County Medical Society, who is chairman.

GUY AUD, Louisville: Gentlemen, I should like to state first that the meeting of the Jefferson County Medical Society will be held this evening at eight o'clock in the Crystal Ballroom, and we are to have as our special guest Dr. Howard A. Kelly of Baltimore who will address the Jefferson County Medical Society and also the members of the Kentucky State Medical Association and the Auxiliary. Your friends are invited.

There will be a public meeting at eight o'clock Tuesday night in the Crystal Ballroom of the Brown Hotel, and the program will consist of the address of the President, Dr. Philip F. Barbour, and the annual oration by Dr. John Lovett Morse, of Boston, President of the American Society of Pediatricians.

There will be a subscription banquet in the Crystal Ballroom of the Brown Hotel Wednesday at 6:30 p. m. The guest speaker will be Dr. Ira V. Hiscock of Yale University. Your wives and friends are invited.

The annual luncheon of the Woman's Auxiliary as guests of the Kentucky State Medical Association will be held at 12:30 p. m. Wednesday in the Crystal Ballroom of the Brown Hotel. The luncheon will be in honor of Mrs. Walter Jackson Freeman of Philadelphia, President of the American Medical Association Auxiliary, and Mrs. Charles E. Oates, of Little Rock, President of the Southern Medical Association Auxiliary.

We have some announcements with regard to golf, but I don't want to bother you with that because they are the rulings of the committee governing the golf tournament that is to be held.

It might be interesting to you to know that at the banquet on Wednesday evening the golf committee will present these trophies.

The automobile committee reports that arrangements have made with Mrs. R. C. Adams of the Auxiliary to supply automobiles as desired, and they will be available at all times.

The Jefferson County Medical Society of course hopes that you all will enjoy your

meeting here very much. If there is anything that we can do for you at any time to help make your stay here more profitable and pleasant, please don't hesitate to call on us. We will be glad to serve you in any way.

THE SECRETARY: I would like to ask the members and the delegates to constitute themselves a committee in regard to the dinner that is to be given by the Association for the Auxiliary on Wednesday. That dinner is for the members of the Auxiliary and visiting women who are in attendance at the sessions of the Auxiliary. Those who merely come to the dinner will be charged \$1. For those who attend the meetings the Association will take care of their expenses.

Gentlemen of the House of Delegates, I have the honor of introducing the President, who will now make his report. Dr. J. T. Reddick, of Paducah. (Applause).

PRESIDENT REDDICK: Gentlemen, I wish to say that it has been a very pleasant year with me so far as the Kentucky State Medical Association is concerned. I haven't had much to do; that has all been done by the Secretary and his office force and the various committees.

I want to again to express my deep appreciation of this distinguished honor that you have conferred upon me. I am proud to have my name identified with the great number of Presidents of the Kentucky State Medical Association who have preceded me.

Our Association is in excellent condition in a great many respects, in practically every respect in fact. We know that we are going to have a good meeting here. We always have good meetings in Louisville; these Louisville doctors do things right when we come to Louisville.

I have nothing further to say except that we want to go on, we want to continue in the good work that we are doing.

Next is the Treasurer's report. That has been published in the JOURNAL.

E. R. PALMER, Louisville: I move we pass the reading of that report.

The motion was seconded and carried.

PRESIDENT REDDICK: Next is the Secretary's report.

#### REPORT OF THE SECRETARY

Mr. President and Gentlemen, as your Secretary I have had the usual happy experience I have been having for twenty-five years with you. My burdens as Secretary of this Association are very light because you do practically all the work yourselves except when you are working me and I have had a very pleasant and profitable year.

I have been able to meet with more of the County Societies this year than for several years.

There has been no time in the history of Kentucky medicine when every member of



the profession has been faced more directly with the difficult problem of continuing to give the broadest and best service to his people, and at the same time to maintain his own home and family because of the unprecedented economic depression. To the younger members of the profession it is very hard to explain this difficulty. It is the sort of thing that I imagine one feels when he is swimming and finds he is in deeper water than it is possible for him to negotiate with safety and he begins to clutch at everything. For the older members it is a return to what in the early history of the profession was a normal condition.

When I made the first survey under your direction as chairman of a committee of this Association in 1898, the average cash income of the practitioner of medicine in Kentucky was a little less than \$800 a year. It is very important for us to remember that, because at that time it was necessary for members of our profession, as it was necessary for many years for members of the ministerial and other professions, to have side-lines of work in order to maintain themselves and educate their families. It was then that Kentucky medicine was for the first time really organized. Before that time we had had, under the old scheme of organization, perfectly delightful meetings of this organization, and the one or two hundred of its members (there were never more than 300 any year before 1898) gathered together in annual session in different parts of the state and mutually conducted proceedings that were of the highest scientific interest to the very small group to whom they were available, but in 1898 when the profession was reorganized and when practically every active physician in the state became a member of it for the first time, we began to take some cognizance of the conditions that confronted the profession and that were causing it such serious concern as to its maintenance.

At that time we had 4200 practitioners in the state. We had then nine medical schools operating in Kentucky. Of course, the older ones amongst us recall that in those days a man went to a medical school and if he paid his fees for a couple of years he graduated; if he didn't pay them he failed under examinations. The result was that we had three classes of practitioners in the state. One was the splendid group of students who really studied wherever they were and who would have learned to practice medicine in any sort of an institution, no matter what sort it was. There was that very much larger group who did hard and difficult work without having had sufficient preliminary training really to acquire the scientific education that was then beginning to be demand-

ed of the successful practitioner, and who have continued to furnish up to the present time the large bulk of that group of our profession that is its most important group, the general practitioner. Then there was possibly a third of the entire membership who ought never to have been admitted into a medical school at all and who were wholly unfit to practice and were a detriment to all the rest of us.

It was perfectly natural that that large group of low-grade men was a group that charged very little for their services. They weren't much and knew it and didn't charge much, because if they charged the same as other doctors they didn't get any practice. That was recognized and is still recognized, and there always will be some men who are worth less than others and who will always charge less than others. That is a thing that has to be recognized in every vocation and profession.

We began at that time, with our brethren in other states, the reorganization of the profession, and in no state was the management of the matter conducted more wisely or with greater self-sacrifice on the part of a large number of the members of our profession than in Kentucky.

Within a few years two of our nine schools had become obsolete and the other seven were combined into what is now the Medical Department of the University of Louisville. Standards were rapidly raised from three to four years, and then a preliminary medical education of at least two years was required. The graduates of our institutions compare favorably with those in any other state.

During the developing period in economics in the country since that time, and due to the fact that the average member of the profession was a very much better qualified physician than he ever had been before, we have made great progress both scientifically and as a self-sustaining profession since those days.

It is very important for us in difficult times like these to counsel together that we may maintain ourselves as we have begun to do as a profession. It is absolutely impossible for a man to practice medicine now without an amount of expense, of cost, that in my younger days was wholly unknown. We had to have very little equipment when I graduated in medicine, unless we practiced surgery. Now every physician who practices medicine has to have an expensive equipment. The actual cost, the maintenance of his office, the maintenance of his office force, the maintenance of the armamentarium with which he practices, involves a very large outlay of money, and the public must sustain that cost if they are to continue to secure the benefits to be derived from modern medical science.

The medical service for the people today is better than it ever was in the history of this country or of any other country in the world, and our people have a better opportunity for proper treatment both for the prevention and the care of disease than they ever had before. It must be constantly borne to them that that is to cost them money, but it costs them very much less money than the disease and death that followed former unqualified practice.

I think it is tremendously important that we keep before our people the fact that the death rate in Kentucky today is considerably less than a third of what it was in 1898 when the profession was reorganized. It is important to keep before them that our morbidity rate has tremendously decreased. We had more cases of typhoid fever in 1898 in Kentucky than we have cases of serious illness all together today.

At the same time that that is true, I think it is very important for the profession to keep before itself the fact that while at one time we felt that there would be a diminishing demand for medical service as disease was eradicated, we now know just as definitely that the decrease in sickness and the continued promotion of better health on the part of our people will require in the future more medical service and more highly scientific medical service than it has ever done. We are having to re-educate our people from merely the old remedial idea that when you go bed you send for a doctor, to the idea that while you are well you consult your physician in his office so as to have his advice in order to remain well. When you are a little sick you go to your doctor's office rather than wait until you are severely sick and call him in to care for you through a severe illness.

It is important that as these services are being so much better rendered today, we educate our public as to the necessity for proper compensation for the physician for his office practice which is well done, in contradistinction to the superficial practice with which they have been acquainted through the generations that have preceded us. As we do that, and in proportion as we do that, we are going to find ourselves, as physicians, human engineers guiding this complicated machinery, individual in its character always.

One of the tendencies of this whole time is the socialization of everything. We have rather gotten the idea that everybody and everything is to be grouped together—one of the unfortunate by-products of a scheme of education that attempts to cut every mind off at exactly the same standard and to educate every child in the same subjects at the same rate of speed, regardless of whether they are slow or smart or average. We have gotten our whole people trained into the idea, for a

generation or two, of thinking in terms of standards and of groups. I think no other responsibility that is before us as a profession is more important than that we constantly bear in mind that there is no procedure yet devised by science that has become sufficiently simplified that it can be applied indiscriminately not only to every individual, but to any large group of individuals without the scientific knowledge and acumen and the personal service of the man who gives that treatment, behind it. There is no group thing that can be done. You can't come into this room and examine this group of people for any purpose, except as to whether they are, or are not, members of the church or whether they are Democrats or Republicans or on some other sociological or semi-political proposition. There is no possible way that your human machinery can be evaluated except by the scientific training and acumen of the individual physician who is going to make that examination of you. Inspections can be made more rapidly, but they should always be known as inspections and an examination should mean an examination by an individual, and treatment should follow the examination of an individual with the proper scientific application of known scientific methods following diagnosis. If we can convince our people of that fact we will have made great progress.

It is important to remember that in Kentucky today we are having gathered together over this state groups called Taxpayers' Leagues that want to reduce public expenses—an eminently proper procedure and one that should have been done years ago by a thoughtful people. But it is important to say to those groups of people that the cost of our state government is less than half today the cost of illness, and that the cost of illness in Kentucky is tremendously increased by the fact that we pay twenty-eight and one-half times as much (our people do) for patent medicines as for preventive medicine: they pay almost exactly the same number of dollars every year for patent medicines that they do for the support of all the hospitals in Kentucky.

We have been derelict in our educational system when we have failed to teach our people that these patent and proprietary medicines that are available in our drug stores upon the request or demand of anybody that pays for them, are so standardized that they can do as little harm to anybody as possible, but at the same time do so little good as to be worthless to even those who need them. The majority of people making self-diagnosis are wholly unable to determine what is the matter with them and haven't the slightest idea what the medicines are that they are giving to



themselves when they purchase them in the drug store.

The side of the reduction of the cost of medical care in Kentucky that is most obvious to any man who studies the statistics of the situation is the education of our people as to their sinning away their day of grace during serious illnesses by taking patent and proprietary ready-made medicines for conditions that they know nothing about, and taking medicines that they know nothing about for their treatment and their cure. That is one of the most obvious things about which we need to talk at women's clubs and luncheon clubs generally and to other groups of people with whom we come in contact that this serious drain on the resources of our people may be saved to them in these difficult times.

It has been my misfortune to come in contact with a large number of cases of serious illness that because of the expense of medical care had purchased patent medicines during the period when they might have been treated successfully, but had come in for treatment after their conditions were practically hopeless. It is our duty over the radio and in every possible way to teach our younger people the dangers of these things that we must succeed in obviating.

It is always a temptation for anybody who comes in contact with your problems, and sees you in your homes and in your societies, as I am constantly doing, to discuss generally the questions that have come to me. I want to avoid yielding to that temptation as much as possible and not take up too much of your time, but I want to thank you all for the effective work, rather to congratulate you than thank you, that has been done by the profession this year. It has been most effective, in spite of the fact that we have had, for the first time since there has been a State Health Department in Kentucky, an increase in our death rate from tuberculosis last year as a result of the continued calamities that have overwhelmed the state for the past several years. We have more malnutrition in our children today than we ever have had before, and as a result of that we were bound to have an increase in our sick and death rate from tuberculosis. We have had more cases of typhoid fever in Kentucky this year than we have had in the nine preceding years all together. That is caused by a conjunction of climatic conditions that could not be helped, and more opportunity has been given for mass infection than heretofore.

The case fatality has been higher this year than it has been previously in the last twenty years.

We have the lowest sick and death rate from diphtheria that we have had at any time in the history of the state. We are making

progress all the time, and the progress is being made in early diagnosis and treatment of conditions, in the education of our people to seek their physicians earlier, and in the prevention of disease, in which every one of us is engaging as one of the major efforts of our work.

It is always a privilege to come before the medical profession of Kentucky as one of its servants. I have had that privilege for a long time, and you have given me an opportunity for contacts that I thank you for from the bottom of my heart. It is always a joy at these annual meetings recurrently to come to you again and to discuss with you sympathetically and feelingly the tremendous problems, the responsibility for the solution of which rests on our shoulders mutually as the representatives of the greatest group of servants that the people of any state have anywhere. (Applause).

A. T. McCORMACK, Secretary.

PRESIDENT REDDICK: Gentlemen, you have heard this splendid report. We are thankful to Dr. McCormack for it. We will now have the report of the Council.

#### REPORT OF THE COUNCIL

We are pleased to report that the paid membership at this time is 1686 as against 1770 on the same date last year. We feel that this is a particularly gratifying report in view of the unprecedented economic depression which has so seriously affected practically every physician in Kentucky. Many of those who are apparently delinquent will pay their dues and retain the continuity of their membership, and we feel that our roll will remain approximately the same as for the past several years. When it is considered that there are a few less than twenty-six hundred physicians now holding certificates to practice in Kentucky, and that nearly four hundred of these are not in active practice, we feel that our membership continues to contain most of the active eligible physicians of the state.

In the current issue of the JOURNAL we have published a report of the auditor on the accounts of the Secretary and Treasurer. We have continued to publish these reports in great detail because we feel that every member of the Association, and particularly every member of the House of Delegates, is entitled to know about the affairs of the organization.

As a going concern, we are in excellent shape. Our total assets are \$20,214.65, as compared with \$20,026.15 last year. The balance in the checking account is \$7,453.18 as against \$7,086.64 last year. The receipts of the JOURNAL were \$8,400.81, which is a remarkably favorable showing as compared with the income of \$8,235.94 last year. The total cost of the JOURNAL this year was \$8,-

263.46. The Council feels that the Association is to be congratulated that it has been able to earn a profit out of it in a year when almost every commercial concern in the country is in the red. This favorable financial situation, of course, has resulted from the continued confidence of our advertisers that the loyal members of this organization will support them because they are bearing the expense of the publication of our JOURNAL. We have been able to have a balance, above operating expenses, for all but two of the last twenty-seven years. The JOURNAL has continued to comply with the policy of this House, of publishing practically all of the articles read before the county societies, as well as the scientific proceedings of the sessions of this Association. Those unfamiliar with this policy have sometimes criticized it. We merit and invite such criticism. The members of the Association have continued to improve the JOURNAL from year to year because their scientific knowledge has improved. Its annual volumes furnish a fair index of the state of medical knowledge in Kentucky.

For the past eight years the Association has co-operated with the State Board of Health in the enforcement of medical practice and other health laws. The House last year authorized an expenditure not to exceed \$1200 for this purpose. We were again fortunate that we were called on for only \$300 of this amount. The Council recommends the appropriation of not to exceed \$1200 for the same purpose next year.

Under our unfortunate and clumsy system of court procedure, the constant changing of county and commonwealth attorneys, elected under our partisan and political system, too frequently results in the election of men who are not sufficiently energetic or interested in law enforcement to effectively enforce the medical and health, or, in fact, any of the other laws of the Commonwealth. It is indeed surprising, under such a system, that the majority are such good officers. Realizing, as physicians do, the vital importance of the health and medical laws, it is natural that irritation will frequently arise amongst them, because of failure in their enforcement. In those sections of the state where physicians have joined with other progressive organizations of citizens in the selection of worth-while attorneys as court officials, there has arisen no complaint. Complaints of evasion of the law come from the poorly organized counties and districts which continue to select these officials as reward for political service or because of the predominating influence of some special interest, and it is apparent that it will be impossible to improve conditions in these sections until public opinion has been educated as to the importance of the selection of competent officials.

This year, again, our attorneys have assisted in the preparation of more than 71 cases and they have been effectively aided by the commonwealth and county attorneys in many sections of the state.

The careful management of the Medico-Legal Committee has kept the expense for attorney's fees at practically the same figure as for previous years. It was \$1,129.48 this year, \$1,125.00 last year and \$1,025.00 for 1930. Court costs this year were only \$19 as against \$190.25 last year. We regret to report that there is no decrease in the number of such unjust blackmail suits against reputable members of the profession. The Association has been fortunate in the excellent management of this committee by its Chairman, Dr. J. B. Lukins, for the past several years. Last year the Council requested Dr. Lukins to prepare a paper on this subject to be read at the General Session, so that the whole profession may have the benefit of his experience and advice. We commend the consideration of this paper and its recommendations to the House of Delegates.

The Council is very happy to report the continuation of the splendid service rendered by the Irvine-McDowell Memorial Hospital for Trachoma, located at Richmond. This excellent institution continues as a living memorial to Ephraim McDowell, the immortal father of ovariectomy. This Association, constituted of the physicians of the state, provides the building, which was bequeathed to it by Dr. McDowell's grand-daughter, Mrs. Elizabeth Irvine. The State Board of Health and the United States Public Health Service jointly furnish the personnel and finance the hospital. The profession and people of Kentucky are grateful to the United States Public Health Service, and, particularly, to Dr. Robert Sory of the Service, who has so effectively managed it since its opening. Last year the Council was authorized to expend not to exceed \$300 for necessary repairs at this institution. We are glad to report that it was found possible to secure this fund from other sources and this expenditure was not made.

Last year an appropriation not to exceed \$1200 was made to continue the active work of the Committee on Public Policy. One thousand, one hundred fifty dollars of this appropriation has been expended and Mr. Blackerby will make a report of his work during the past year. The Council recommends that this appropriation be continued.

The Council desires again to emphasize that the JOURNAL has been published at a profit because of its continued support by our advertisers. The importance of the patronage of these advertisers by our members cannot be given too much emphasis. The value of the JOURNAL to every reader is apparent.



This Association guarantees the financial integrity of the advertising columns of the JOURNAL. For these reasons we feel we have a right to ask our members to give our advertisers their patronage, other things being equal. The Council recommends that the Association express its gratitude to the American Medical Association and especially to its Cooperative Medical Advertising Bureau for the splendid work it has done in securing national advertising. Under the management of Mr. Mattison this bureau of the parent organization has made possible the general excellence of state journals in most of the states.

The same remarks apply to the exhibits at the annual meetings. These exhibitors pay the expenses of the scientific sessions. They are carefully selected from among a large number of applicants by a special committee of the Council and they exhibit the annual improvements in medical and surgical technique in a very effective way. The exhibit this year is particularly interesting, and the Council desires to urge those in attendance to carefully study it.

The Council urges that the House of Delegates express its appreciation to those counties that have organized a Woman's Auxiliary. It urges every other county to organize this necessary adjunct as rapidly as possible. The President of the Auxiliary will report as to its activities during the past year, but the Council particularly desires to congratulate the officers of the Auxiliary on the publication and maintenance of its Quarterly Supplement to the JOURNAL. This has been published without cost to the Association, and we feel that it is one of the most creditable things that has been accomplished in the extension of medical education in the state. Its pages have given to the women of the profession, as well as to our own members, many important facts that help in getting before the public the important achievements and responsibilities of the profession. The Council is requesting the Auxiliary to continue the publication of the Quarterly as a supplement to the JOURNAL. The Council recommends that the appropriation of not to exceed \$500, to assist in the development of the Auxiliary, be continued next year.

During the year Hygeia has received many more subscriptions in the counties where the Auxiliaries are organized than ever before. During the coming year an attempt will be made to secure 5,000 more subscriptions to this important publication of the profession in Kentucky. The Council urges that in every county the wives, widows, mothers and daughters of physicians be organized into an active club which will be continually doing things for the welfare of the state.

More county societies have met regularly

than for many years. Councilor district associations have been organized in more districts and are doing a valuable service. The Council again wishes to emphasize the importance of the preservation of the organization and the integrity of the work of the county societies themselves, regardless of the interest that is being developed in meetings of groups of counties. The leaders of the profession will always attend medical meetings anywhere, because they recognize their value. In our type of organization it is essential that the affairs of each county society shall be considered by its own members and that its meetings be held within its confines so that all of them may have the opportunity of attending.

We are also gratified that members of the profession entering the various specialties in medicine are spending a longer time in their preparation and study for such a career, and we believe that physicians should not announce that they limit their practice to a particular specialty until they have attained such a degree of education and experience as will entitle them to membership in the learned societies of their proposed specialties.

The Secretary-Editor, the Business Manager of the JOURNAL, and Mr. Blackerby voluntarily reduced their salaries 10 per cent as of April 1st. This action on their part in preserving the assets of the Association in these difficult times is to be commended.

The Council recognizes that the physicians of the state have shared with every other profession and with business concerns and our people generally the destructive effects of the great financial depression. As might have been expected from past experience, this has weighed most heavily upon the medical profession. Sickness is no respecter of financial conditions. For the past six years Kentucky has undergone a series of extended calamities which have levied an increasing toll on the health and welfare of our people, and this has been particularly true of the children. There are more poorly nourished children in Kentucky today than probably ever before in its history. It is gratifying to note the efforts that are being made by the people of many counties to lessen this danger. It is important that the profession continue to give its support to every such movement. The greatest reward received by any physician is his opportunity for service. Too frequently in the past few years this has been almost his only reward, but historians of the future will record with pride the fine service of the profession which has continued to be rendered to the people of the state during these trying times.

Respectfully submitted,

C. A. VANCE, Chairman.

(Signed by order of the Council).

The Secretary, A. T. McCormack, took the Chair in the absence of the President.

CHAIRMAN McCORMACK: You have heard the report of the Council. Unless there is objection it will be referred to the Committee on the Report of the Council for report.

Next is Report of Councilors by Districts.

#### REPORT OF COUNCILOR, FIRST DISTRICT

V. A. STILLEY, Benton: There has been a small loss in the membership of the First District, but it is almost entirely due to death; some of the older members are dropping off. So far as concerns the active membership of the First District, we have fully as many members as we have had except for those lost by death.

We have a district society that meets four times a year, and it is well attended. Practically every county in my district has a well working county organization. Some have adopted the plan of having the Auxiliary meet with the doctors. They meet and have lunch, the Auxiliary meets in one room and the medical profession in another. That has been a great help to us in many of the counties. Some of the counties that did not have an active organization until a short time ago, meet regularly now, and we feel that has been a very great help to us. I think the profession in our end of the state, taken as a whole, is in good shape, considering this new thing, the depression, as it ever has been.

#### REPORT OF COUNCILOR, THIRD DISTRICT

C. C. HOWARD, Glasgow: Mr. Chairman and Gentlemen: I want to report that the Third District is composed of eleven counties. We have 133 doctors in a population of 215,000. We have had two deaths and two new doctors have come in.

I have served this district through the period of this depression, since about the time Hoover was elected President, but I'm not making any speech for re-election.

We have had quite a few good meetings in our district this year. Our district meetings are well attended and the programs have improved. The district meetings are at Bowling Green every other month and once a year at Glasgow and once a year down in Hopkinsville.

I want to say to the Association that I believe all doctors are writing better papers, they are limiting them, I hope they will limit them a little more, and I think they can. I am not so struck on the idea of a man writing a paper and referring to everybody in Europe and in the United States. I really believe a fellow should sort of report something that he has observed himself occasionally.

At our hospital we have had an institute conducted once a year. It is a two-day institute. We try to have some man of note in in some certain branch of medicine. These men are paid to come by the Commonwealth

Fund of New York. One of the finest meetings we had was at Glasgow, with Dr. McCord, of Atlanta, on obstetrics. I think that was one of the most beneficial meetings we had.

This year I have tried to visit my district more, just from a personal standpoint. I am not getting so very old, but I like to visit doctors, so I have tried to visit every county. I have tried to see a great many doctors in their homes and in their offices. I don't believe you can exactly size up a fellow at one of these meetings, because he usually puts on his Sunday clothes and comes to the convention where we are all feeling good, so I like to see how he is practicing medicine. I get something out of it every time; I carry something home that he is doing, how he is meeting the situation, and it has been worth a lot to me this year to visit each county.

I went down to Hopkinsville and had a very nice meeting there. I enjoyed those men; I think a lot of them. They have done one thing at Hopkinsville that is the most commendable thing, to my mind, that has been done in our District. Some years ago there was an old country doctor who lived way up in the country, and his wife fell and broke her hip at Hopkinsville. They had no place to care for her. I rather think that is what gave him the idea. He gave them the money and also drew up the laws and by-laws for their hospital. The hospital was erected and those doctors have operated it for fifteen years, I believe. They have done it successfully. It has been supported by donations from grateful patients.

That is an ideal condition they have, and those men are serving their community as well as anyone I know of in the State of Kentucky. They have a nurses' training school, and they have been graduating just about enough to take care of their own community.

They had one little grievance they wanted to discuss with me. They think they have had a lot of trouble with regard to their school being recognized each year. I have heard that discussed both ways, and I am of the opinion that these men are correct. Their community is well cared for. They graduate their own girls, only three or four a year. The community assimilates those that don't marry, and uses them right there at home, and they serve those doctors well. The hospital has been in existence for fifteen years. It is a forty or fifty-bed hospital, and I feel they should be commended. I am very proud of them.

Another thing of interest in the Third District this year is that there are seven county health units in operation. I have attended two or three of their meetings with the doctors and nurses there and the doctors in the adjoining territory. They have had excel-



lent programs, well outlined, and very beneficial. They have really done a great deal of good. Public health has taken its place and is going to do so more and more. The doctor must keep in step with that and take care of it or it will finally take care of him. It is a big question as to just how this ought all to come around. We as doctors must help shape this thing, because that is part of our profession. In other words, they are the advance guard. Just how far a health unit should go in operation is a big question. There are some counties where it should go much farther than in other counties. There are some isolated counties that have so few doctors that a health unit has to do a great deal more than it would in some other counties, but this body of men should think this over and discuss it, and with the health officers and the health department find where the dividing line between them is in practicing medicine and preventing sickness. They are the advance guard, as I say, but we must help them. It is an unsolved question as to exactly where the health unit should stop.

Roads have improved greatly in our district. For that reason our doctors serve so many more people. We have 133 doctors. We have had only two deaths, and two new doctors are registered, so we played even.

I want to recommend that every Councilor, if possible, visit his counties and visit the doctors personally. I like to see a doctor's office. I don't believe the average doctor keeps his office clean enough. A long time ago I decided that no man ever should operate who didn't have clean hands all the time.

PRESIDENT REDDICK: I was very glad to hear Dr. Howard mention the name of Dr. McCord. I have had some correspondence recently with Dr. Veech, and she has invited Dr. McCord to the state again, and our county society last week unanimously and enthusiastically voted to have him come to Paducah for about five days on obstetrics. We are going to invite all of that end of the state, or anyone else who wishes to come. I have been reading after Dr. McCord for a number of years. I heard him last November at the Southern Medical in New Orleans, and he is a live wire and a great teacher. I want to speak of this especially to the members in Western Kentucky. We are going to have him there sometime next spring.

J. W. SCOTT, Lexington: Is it in order to discuss the report that Dr. Howard has made?

PRESIDENT REDDICK: Yes, sir.

J. W. SCOTT: There is one thing I want to discuss, which may be in order later on and not in order at present, and that is the matter which Dr. Howard referred to with reference to the plight of the hospitals in the smaller communities, and their training schools. Will that come up later? If it will,

I will save this House's time and not discuss it now.

THE SECRETARY: Dr. Howard is Chairman of a Committee on that subject. I presume he will have a report to make at a later time.

C. C. HOWARD: I will, but let him discuss it now.

J. W. SCOTT: Dr. Howard is referring to the plight of the hospital in the smaller community, which has a training school and which faces the danger, as I see it the certainty, of being closed up. The policy of the high command, so to speak, of the nurses' organization in this state is to close the training schools in small hospitals. I think while, as Dr. Howard has said, there is something to be said on both sides, I should like to emphasize what is to be said in favor of the training school in the small hospital. It is perfectly true that the nurse who is trained in the hospital in Glasgow, the nurse who is trained in the hospital in Cynthiana, and in other towns of the same sort, cannot have the kind of training and the kind of lectures that the nurses receive in the City of Louisville. At the same time, they serve a useful purpose. In fact, it is very difficult for those hospitals to operate without their training schools. I believe that the men in those small communities are able to give the nurses what they need for the proper care of the sick. I think we are in great danger of raising the standard of non-medical workers and of nurses, of technicians, and all of those people, to such a high grade that the cost of medical care is added to, that we are strangling those who have sufficient qualification to perform this duty in order to broaden the phylactery and enlarge the horn of those who are in higher places. I believe in the sophistication of the doctor in not lowering the standard of the medical profession, but I do believe that we are raising too high the standard of the nursing profession and of the profession of the technician.

#### REPORT OF COUNCILOR, FOURTH DISTRICT

J. I. GREENWELL, New Haven: The medical profession of the Fourth District is in splendid working order. Co-operation among the doctors is getting better day by day. I think it is due to the doctors meeting together more often, thereby becoming better acquainted. Nearly every county in the district has a well organized society which has its regular meetings. The membership is about the same as last year, which I think speaks well considering the depression and drouth which we have had during the last two years.

I hope to be able to report at the next meeting an active county society in each county with notable increase in members. I pledge myself to do all in my power to accomplish this end.

## REPORT OF COUNCILOR, FIFTH DISTRICT

W. E. GARDNER, Louisville: As Councilor for the Fifth District, which is composed of Jefferson County and eight counties outside of Jefferson, I am glad to report that the district has gone along in a very satisfactory way during the past year, considering our trying times. We have had some losses in membership throughout the district, as has occurred in other districts in the state, and yet the Jefferson County Society manages to maintain a pretty full membership and for this reason our loss is not as perceptible as it might be under other circumstances.

Several of our counties have only two or three doctors, and it is almost impossible to have them meet with any regularity. However, this idea has been encouraged more and more, and I agree most heartily with Dr. Vance, the Chairman of the Council, in his report that the interest should be maintained in the county society and its integrity preserved as far as possible. However, in these smaller counties where the meetings are held so seldom, it becomes almost necessary that we have within the district what is known as a district society, and for this reason, somewhat more than a year ago we organized the Fifth District Medical Society. It holds its meetings twice a year at Carrollton, Kentucky, which seems to be about the most central point in the district. We have had some very interesting meetings there, nice programs, and good attendance. Our next meeting will occur on November 10th, and I trust that any of you who are accessible to Carrollton, even though you do not live in the district, will bear this meeting in mind. We shall be glad to have any members of the profession in this state outside of the district attend.

There has been a spirit of good fellowship among the doctors of the district. Everybody is interested, and on the whole we feel, considering our depressed condition, that we have gone along remarkably well.

## REPORT OF COUNCILOR, SEVENTH DISTRICT

V. G. KINNAIRD, Lancaster: We have had 57 members this year as against 56 last year in the Seventh District. Almost every eligible physician in the district is a member and we have held excellent councilor district meetings at Crab Orchard Springs this year. Conditions in the district are satisfactory.

## REPORT OF COUNCILOR, NINTH DISTRICT

S. C. SMITH, Ashland: Mr. President and Members of the House of Delegates: The Ninth District at this time is in very good condition. Our membership has fallen off some, but nothing like you would expect, and most of the counties have an active society that meets regularly or occasionally. Some of them don't meet regularly, but they do have at least one meeting a year.

We have had one new society organized in the district, that is in Greenup County, and on the whole everything is going along very satisfactorily.

I want to mention one thing that Dr. Howard brought up in his discussion, and that is the extent to which county health departments should go. We have several county health departments in the Ninth District, and I find that there is a great tendency of county health units to encroach on the province of the general practitioners. For instance, they will say that all children must have toxin antitoxin or they must have small pox vaccine, and that the doctors must give it to them, if they don't they are going to give it. The doctors have no way of getting them out, and the result is that the health department will go around to the schools and give them this at a very small cost, what they have to pay for the material used. They draw no line on charity cases. The result is that the doctor at a time when he needs it is knocked out of a large income on vaccination against smallpox and the administration of toxoid and toxin antitoxin for the prevention of diphtheria.

In those cases where they conduct venereal clinics, the health officer should always be fair with the profession in treating charity cases. I fear that too frequently they treat patients that are perfectly able to pay for the service. That is something that we as members of the Kentucky Medical Association and the various county societies are going to have to solve, else the county health department will be doing a lot of work that we ought to be doing. In fact, they are already doing it, and they are going to be doing more if we don't put a stop to it.

SMITHFIELD KEFFER, Grayson: I would like to say a word about the venereal clinics. I started giving 606 to a patient. I gave him three doses. I was charging him \$5 an injection, and he didn't pay. He said, "I'm going over to the county health department. They will give it to me for a dollar."

I said, "You go." He went over there and got it. I don't think that is fair. That man was able to pay for it. I have known of others doing the same thing. I don't know much about medicine, but I can give a dose of 606 about as good as the average country doctor, and I have never had any serious accidents result from it. I think that much of an intrusion is wrong. I think a man who can pay for his doctoring ought to pay for it, especially in these times. It is all very well for them to take our prostitutes and jailbirds and the people who are unable to pay. Let the county health unit treat them; as a class they have no money, but we



ought to draw the line somewhere with people who are able to pay.

E. N. EWERS, Somerset: The county that I come from has a very ideal way of serving this venereal clinic. We do not have any trouble on the venereal side. We do have some trouble with the smallpox and toxoid and toxin antitoxin, but no patient is treated in the venereal clinic unless he brings a written statement from the doctor that he is unable to pay. You told the chap to go to the county health department, and he went. If you hadn't said go, he wouldn't have gone, or if he had gone he wouldn't have carried with him the word that the doctor told him to go.

SMITHFIELD KEFFER: I wanted him to pay; that's why he went.

H. G. SANDLIN, Richmond: We had the same trouble and we adopted the same plan that has been mentioned, of having them bring a certificate from the family physician, stating that they are unable to pay and requesting treatment. In that way we eliminated a great deal of the objection that we had.

#### REPORT OF COUNCILOR, TENTH DISTRICT

C. A. VANCE, Lexington: The Tenth Councilor District is in fine condition, and I have the honor to submit herewith the following report:

According to the paid-up membership for 1932, the Tenth District has 239 paid-up members. The County Society register is as follows:

County	Members	Non-Members
Bath .....	8	3
Bourbon .....	15	9
Breathitt .....	7	2
Clark .....	19	4
Estill .....	5	2
Fayette .....	105	25
Jessamine .....	11	3
Lee .....	2	3
Madison .....	29	9
Menifee .....	0	2
Montgomery .....	11	2
Morgan .....	2	2
Powell .....	0	5
Rowan .....	2	2
Scott .....	13	0
Wolfe .....	1	3
Woodford .....	9	4
Total .....	239	80

This shows that in addition to the 239 paid-up members in the county societies that there are 80 non-members in these counties. There are possibly a few eligible non-members and in several of the societies there are applications pending, and in several of the societies a few of the old members have not yet paid their dues. I suppose we might

blame this on the depression. We have made every effort to collect these dues and enroll all eligible non-members, but we have not been entirely successful. However, the total paid-up membership for this year is three more than were enrolled last year. The membership has increased a little in the last four or five years, so I feel that the work of the county societies and the membership have improved and increased a good deal in the last five years.

Bath, Breathitt, Estill, Jessamine, Lee, Menifee, Montgomery, Morgan Powell, Rowan, Wolfe and Woodford County Societies hold occasional meetings.

The Woodford County Society re-organized this year and seems to be in better condition than in previous years.

Bourbon, Clark, Fayette, Madison and Scott hold regular monthly meetings, and these are all generally well attended with good programs.

Fayette County Society meetings have been more largely attended this year than any previous year. They now have a permanent meeting place at the Good Samaritan Hospital, and I look for even a larger attendance in the future.

I wish to call special attention to the programs of the Madison County Society during this year. Drs. R. H. Cowley of Berea, and Sandlin and Dunn, of Richmond, have been largely instrumental in arranging these programs, and they have had fine attendance at all the meetings. In this connection I believe that the societies which arrange their programs from their own membership have much better meetings and much more interest and loyalty than the society which brings in outside talent.

I feel that the profession generally is loyal and much interested in the state association and all are willing to help out in any way they can. I have not heard of any malpractice suits being brought to court against any of our members in the Tenth District in the past year, although several have been threatened.

The Fayette County Society lost one of its most beloved members during the past year. Dr. David Barrow, of Lexington. He had served the county society and the state association for many years and had been president of both, and his loss will be keenly felt.

In closing, I would like to urge that the members of each county society select the best man available for secretary for the coming year. I believe that the secretary is the most important officer of a society, and if he fails in his job the society suffers. In many instances the secretary carries the whole load himself and the good one is always willing to do this.

## REPORT OF COUNCILOR, ELEVENTH DISTRICT

W. M. MARTIN, Harlan: I am very glad to report that the Eleventh District is in as good condition as I expect almost any other district in the state is. We have lost but very few members. I expect that the Eleventh District, being mostly a coal district, has been harder hit financially than almost any district of the state, or as hard hit at least.

Some objection has been made, I believe, to the State Board of Health taking an active part in the treatment of venereal disease, etc. I believe that all the doctors of the Eleventh District will agree with me that we would be glad if they would do it all, especially during this administration; we don't get any money out of it.

Our doctors are to be highly congratulated for the great interest they have taken in preventive medicine during the depression. In my own county I think there were something over 10,000 typhoid fever shots given free. Very few doctors collect anything for giving typhoid fever inoculation.

In the Harlan County Medical Society it was voted by the society, which has a membership of about fifty-two, and published in the daily paper of Harlan, that we would give typhoid inoculations to anyone who would accept them. The people responded pretty well. Of course, there were a few doctors who objected to that, but after they studied the matter over they found it was much cheaper to give a few shots of typhoid inoculation than it was to treat the typhoid fever for nothing, so that worked out very nicely.

We have a society in the district which is known as the Cumberland Valley Medical Society, which is composed of five counties. I hope that some of the doctors from Knox County and Bell County will be here. Our last meeting of this district society would have been a complete failure had it not been for Harlan County; although this meeting was held at the most beautiful place in the section, at Clear Creek Springs, in Bell County, there were two Bell County doctors there. I wish some of them were here; there was no excuse at all for their not being there. We had a great delegation from Harlan.

It may be that the reason there were so many Harlan County doctors was that they had less work to do than these other doctors; if that is true it is excusable.

We have a couple of doctors who are employed by the county (I think their salaries are \$6500 a year) to treat the paupers. That was all right for a while, but we have so many paupers that they can't do it, so we doctors are aiding them, letting them draw the money, and we go right along just the same.

I think our district is in pretty fair shape, and if they get a new Councilor I think it can do much better.

PRESIDENT REDDICK: The next order is Report of Delegates by Counties.

## CALLOWAY COUNTY

BEN B. KEYS, Murray: Our county society has again enjoyed a good year. We have about sixteen doctors in all, with about fourteen paid memberships, and we think that is pretty good under the economic conditions. Of these two doctors that have not paid, one is getting very old and is practically retired and the other has been sick and doesn't do much general work.

We have our meetings quarterly, with a luncheon in the evening. Occasionally we have a joint meeting with the Auxiliary. We enjoy very much having them with us and benefit by the splendid suggestions and co-operation they have rendered. After the luncheon meeting they retire to the quarters and proceed with their program.

Our programs are good, with splendid interest and good fellowship. Occasionally we have an out-of-town speaker that we think also adds to the interest of the meeting.

## FAYETTE COUNTY

J. W. SCOTT, Lexington: Dr. Vance in his report as Councilor covered all the essential facts in regard to the Fayette County Society. We have 102 members. I note that the Treasurer's report indicates that \$530 has been paid by this society. This would seem to indicate that our efficient secretary, Dr. John Harvey, has been able to persuade four men to pay dues twice or else to collect arrears. In either case I think it is an indication of his high degree of efficiency.

## GRANT COUNTY

C. M. ECKLER, Williamstown: Since my report to you in Lexington, one year ago, Grant County has no new members of the medical profession. We have lost one by death, Dr. R. E. Limerick, of the Northeastern section of our county, who answered the final summons on May 28th, last. He died of cerebral hemorrhage at the age of seventy-three, having served his people and community for forty-eight consecutive years—a splendid physician and a man of true Christian character.

Grant County Medical Society has 100 per cent enrollment. 85 per cent attendance, 100 per cent in morale and fellowship.

We have a splendid health unit with which we have full co-operation. Their work has been beneficial, helpful and pleasant.

We, too, have experienced the hardships and ill effects of the depression, but most of us have learned to grin and bear it, and those who couldn't grin are bearing it anyhow.

All of our members are owners of good



homes and are not wanting for the necessities of life. We have good roads, large territory and are all kept busy.

There seems to be a feeling of optimism that things are looking better. We have fought the fight, kept the faith, and believe in due time we shall receive our just reward.

#### GREENUP COUNTY

W. H. JOYNER: We have twelve members out of an eligibility of eighteen. We have not met much this last summer, but previous to that time we met regularly on the second Friday evening in each month. We have had only two home talent papers, but have had a number of papers from visiting doctors.

#### HARRISON COUNTY

W. B. MOORE, Cynthiana: The Harrison County Medical Society has sixteen members. We lost one member for non-payment of dues, the only eligible physician in the county who is not a member of the society.

The society meets on the first Monday evening in each month. The average attendance this year has been twelve. We had eleven papers with liberal discussion, and a goodly number of case reports which are sometimes most interesting, in fact the most interesting part of the program. Our programs are printed and distributed for the year at the January meeting. The December meeting is given over to the election of officers and the annual banquet, when we have a number of visitors and a general good time.

#### NELSON COUNTY

R. H. GREENWELL, New Haven: We have ten doctors who belong to the county society, and three non members. We have district meetings usually two or three times a year. The Woman's Auxiliary meets with our county society, usually at a dinner meeting. As a rule, we have speakers from various sections of the state.

#### MASON COUNTY

M. H. DAVIS, Mayslick: A regular meeting has been held the second Wednesday of every month, with a scientific program each time. The following physicians have favored the society:

Effie Graff, Louisville; A. Graeme Mitchell, Cincinnati; Howard B. McIntyre, Cincinnati; Cecil Striker, Cincinnati; H. Jerry Lavender, Cincinnati; John Fisher, DeCourcy Clinic, Cincinnati; Rufus Alley, Lexington Clinic, Lexington; Carl Fortune, Lexington Clinic, Lexington; Donnan Harding, Lexington Clinic, Lexington; Francis Massie, Lexington Clinic, Lexington; E. C. Yates, Lexington Clinic, Lexington; C. C. Barrett, Lexington.

Total of twelve speakers from January to September inclusive with arrangements made for Drs. Garr and Maxwell of Lexington and

Dr. Carl Lewis Wheeler to speak at the October meeting.

Our total membership is twenty. The total number of doctors in the county is twenty-four.

We are indebted to Dr. Murphy, our health officer, and also our efficient Secretary for the arrangement of programs and the increased interest in the meetings.

#### PULASKI COUNTY

W. R. CUNDIFF, Somerset: Pulaski County has twenty white doctors and one colored. Fourteen have paid dues for 1932. During the year of 1932 we have had seven medical meetings with an average attendance of twelve members, besides one joint meeting at Stearns, Kentucky, with Wayne and McCreary Counties.

The county society is in good working order and good financial condition.

#### SHELBY COUNTY

W. E. MOORE: To the House of Delegates assembled, I beg to report the Medical Society of Shelby County is in splendid condition. We have seventeen physicians in the county. Fifteen of these are members of the county society and in good standing. We meet on the third Thursday evening of each month, with an average of fifteen in attendance.

SECRETARY McCORMACK: There are several Chairman of Committees present, and I would like to suggest that we ask them to make their reports now so as to obviate the necessity for a night session that will conflict with Dr. Kelly's address.

PRESIDENT REDDICK: Report of the Committee for the Control of Cancer, L. Wallace Frank, Chairman.

L. WALLACE FRANK, Louisville: Your Committee for the Control of Cancer desires to submit the following report.

As predicted in our communication of a year ago, the Norton Memorial Infirmary opened its Free Clinic for the Diagnosis of Cancer on January 1, 1932. On May 1, 1932, a similar free diagnostic clinic was opened at St. Joseph's Infirmary, both being situated in Louisville. These clinics mark a distinct forward step in the control of this dread malady, and it is the hope of this committee that other clinics for the diagnosis of malignancy be founded in different sections of the state.

The incidence of cancer is becoming greater throughout the country; whether this be due to better diagnosis of malignancy or to the fact that more individuals live to the cancer age we are unable to say. No new method of treatment for the cure of this condition has been developed, and we believe that it is only by the dissemination of the knowledge of cancer and its manifestations that it can be

controlled. The prevention of cancer is impossible because we do not know the exciting cause. Nevertheless, prompt attention to any area of chronic irritation may lessen the incidence of the disease. Certainly the early recognition of the presence of cancer and the immediate institution of treatment, be it surgery, radium, x-ray or thermal, will tend to lessen the mortality from this disease.

Inasmuch as it is by the dissemination of the knowledge of cancer, not only to the laity but also to the profession, that we become cancer conscious, your committee would propose the following plan for the ensuing year:

1. That each county medical society and each district society have a symposium on cancer during the coming year.

2. That at this meeting breast lesions especially should be considered and due consideration be given the different diagnoses of breast tumors, and that the clinical manifestations of early breast cancer be elucidated and demonstrated if possible.

3. That abstracts of discussions presented at such meetings be prepared for publication in the local newspapers so that the laity will become acquainted with our efforts. The question naturally arises: Who will make these talks on cancer? We would suggest that each society select a man of wide experience in the management of the disease, and we trust that many will volunteer to present such papers. If speakers are not available from the local society, your committee will be glad to supply such speakers.

Respectfully,  
C. A. Vance  
P. H. Stewart  
A. W. Davis  
Paul Gronnerud  
L. Wallace Frank, Chairman.

PRESIDENT REDDICK: I think it would be advisable to have a motion to accept the report and to approve its recommendations.

A motion was regularly made, seconded and unanimously carried that the report be accepted and the recommendations approved.

PRESIDENT REDDICK: Report of the Committee on Workmen's Compensation Law, Frank P. Strickler, Chairman.

FRANK P. STRICKLER, Louisville: This is a subject that I think is rather important. There is hardly a doctor who does not at one time or another, whether he desires to or not, come in contact with a compensation case in some form. There are adequate funds paid into the State of Kentucky to pay a fair and proper scale for the treatment of these cases. This money, though, instead of being turned back to the care of compensation cases, is diverted to other sources. If we could use this money in the care of industrial cases, we would have plenty of money in the State of

Kentucky to pay a fair fee for the treatment of any of these cases.

Your Committee on Workmen's Compensation presents the following report:

The Committee on Workmen's Compensation, after interviewing many doctors and institutions throughout the state who are directly or indirectly in contact with the treatment of patients who are injured and come under the Compensation Act, are universally of the opinion that the limit of two hundred dollars as established by the present Compensation Law of Kentucky is entirely inadequate to furnish first-class hospitalization and surgical treatment for the individual injured in industrial work. The doctors, nurses and hospitals of the State of Kentucky have lost thousands of dollars as the result of the two hundred dollar limit now established by the Compensation Law.

We also find that some insurance companies prorate there bills, which serves to beat the doctor, nurse and hospital out of a justly earned fee. This practice of insurance companies is unreservedly condemned by the Committee on Workmen's Compensation. There are a number of the first-class insurance companies doing business in the State of Kentucky who are perfectly willing to pay a fair medical and hospital bill. These companies completely ignore the two hundred dollar limit as established by the Workmen's Compensation Act, and do not resort to the tactics employed by adjusters of second-rate companies.

As the Compensation Act is a subject all doctors, hospitals and nurses throughout the State of Kentucky are interested in, this Committee recommends that the Kentucky State Medical Society take active steps before the legislature at its next meeting to bring about a change in the law in order that the medical profession and its allied professions be properly and fairly compensated for their work. To do this we feel that a limit of at least eight hundred dollars should be established for medical fees, as this is about the average limit established in other states. However, there are a number of states which have no limit at all for medical services. Kentucky is woefully behind in its compensation laws, and little if anything has been done to protect the medical profession. The Jefferson County Medical Society did have a bill submitted to the last legislature in an effort to remedy present conditions, but this bill apparently never came out of the Committee.

If the Kentucky State Medical Association, and the Kentucky Nurses' Association and the Kentucky Hospital Association will combine their efforts, I feel certain that the Compensation Law could be altered and Ken-



tucky put on the same basis as other progressive states in the Union.

Respectfully submitted,  
Frank P. Strickler, Chairman.

A. T. McCORMACK: I move that this report be approved and referred to the Committee on Legislation and Public Policy, with the request that they take the necessary action to make it effective.

The motion was seconded by Smithfield Keffer, Grayson, and carried.

PRESIDENT REDDICK: We have with us at this time, Mrs. Hendon, President of the Woman's Auxiliary, who will now report for the Woman's Auxiliary. I am sure you will be also glad to know that the Quarterly is paying its own expenses and they are doing a great work. We would be very much pleased to hear this fine report she is going to make.

#### REPORT OF THE WOMAN'S AUXILIARY

Mr. President, Mr. Secretary, Members of the House of Delegates, and I presume friends: It now becomes my privilege to submit for your consideration and approval the President's annual report of the Woman's Auxiliary. I beg your indulgence while I recite in as brief outline as may be consistent with clarity, the advances we have made in the direction of the various interests indicated by the program for which we had already assumed responsibility, and the more recent enterprises which it seemed necessary to include in order to adequately enlarge our field of usefulness.

I would also solicit your sympathetic interest and cordial co-operation in support of the aims and ambitions that we cherish for the future.

We realize that the ideals of our two organizations must be identical to afford the successful issue of whatever plan of campaign we may adopt. Therefore, I am asking in behalf of the Auxiliary for your complete confidence and the wisdom of your mature judgment which we regard as indispensable to our cause.

Our labors during the past year have been directed along the following lines:

Continued collection of medical historical data of Kentucky pioneers.

Increased circulation of Hygeia, the health magazine published by the American Medical Association. At the meeting of the American Medical Auxiliary held in New Orleans in May of this year, a bulletin in Exhibit Hall contained the following:

"Number members of Kentucky State Medical Association ..... 1821  
Number Auxiliary Members..... 430  
Number subscriptions to Hygeia in

Kentucky ..... 605  
Number secured through auxiliaries.... 68"

This reports shows subscriptions for Hygeia are purchased in Kentucky, and if subscrip-

tions and renewals are secured through the auxiliaries, a worthwhile sum will accrue to the Auxiliary making the contact. The price of subscription to Hygeia has been reduced to \$2.50 a year, and of this amount the Auxiliary retains one-half, or \$1.25 on each subscription or renewal.

I should like to make a special appeal to the doctors who are not subscribers, to get in touch with their county auxiliary Hygeia chairman and give her your subscription, and those who are subscribers give her your renewal. County Hygeia chairmen this year are as follows:

Calloway County—Mrs. A. J. Outland, Murray.

Campbell-Kenton—Miss Pauline Haley, 304 Doctors' Bldg., Covington.

Graves—Mrs. J. H. Shelton, Mayfield.

Hardin—Mrs. C. F. Long, Elizabethtown.

Jefferson — Mrs. J. S. Bumgardner, Springdale Apt., Louisville.

Benton—Mrs. V. A. Stilley.

Perry—Mrs. R. L. Collins, Hazard.

Whitley—Mrs. M. W. Steele, Corbin.

Radio health programs in Jefferson County which were started February 13, 1930, over WLAP, are now presented over WHAS every Wednesday at 10:25 a. m., the first broadcast taking place June 8th, 1932. Each program is prepared by a local physician who selects his own subjects, and who is introduced by a member of the Auxiliary. On the last Thursday of each month at 10:25 a. m., programs appropriate to the season have been forwarded by our Radio Committee to be broadcast from Paducah, Covington and Hopkinsville.

Study classes for self-education in medical and health laws of Kentucky, and the Study Envelopes 1-2-3-4-5, issued by the American Medical Association, have been emphasized, not only in our own county Auxiliaries, but by numerous Parent-Teacher Associations and Women's Club groups.

Another educational feature is embodied in the series of Questions and Answers which are carried in various newspapers, sample of which is herewith presented (copy handed to President Reddick), giving the public in broken doses, information which is important to them, which we have reason to believe are usually read.

Regarding the Jane Todd Crawford project which lies so near our hearts, we have been able this year to define the road over which Jane Crawford probably passed from her home in Green County to Danville, for the memorable operation in the home of Dr. Ephraim McDowell in 1809, and the official naming of that road by the State Highway Commission. "The Jane Todd Crawford Trail," and it is our hope and expectation to have this trail planted with trees and

shrubs and identified by appropriate signs.

Since one of the aims of our Auxiliary is "to promote acquaintanceship among doctors' families that local unity and harmony may be increased," the Jane Todd Crawford Committee sponsored a get-acquainted party on the evening of May 17, in the beautiful auditorium of the Grocers' Baking Company, Louisville, which was a success both financially and socially.

It was my rare privilege to be invited to attend the meeting of the Woman's Auxiliary to the Virginia State Medical Association, which was held in Roanoke, October 8 and 9, where I motored with Dr. and Mrs. McCormack. This meeting was instructive and is one of my most pleasant memories of the year.

On October 14, I attended the meeting of the Nelson County Medical Society at Bardstown and in the afternoon organized the Nelson County Auxiliary, with eight members.

In December, a luncheon was held at the Brown Hotel, where health and welfare representatives attended and took part in the program which followed, one of the results being our "Come and See Trips" inaugurated in April, sponsored by the Community Chest, which consisted in making personally conducted visits to hospitals, clinics, day nurseries, orphanages and other charitable institutions. A brief talk on the institution to be visited preceded the tour. These trips, five in number, gave a much clearer idea of the welfare work of our physicians who give so generously of their time and skill.

Activities in the county auxiliaries include many local interests, such as child health clinics, pre-natal clinics, hospital and social welfare work, and tuberculosis clinics. In our largest county auxiliary, three units have been organized which are of paramount interest; one, the study class which meets once a month, is devoted to a paper on some historical medical subject, prepared and read by a member followed by current events of particular interest to members. The sewing unit meets each month in the home of one of the members where appropriate garments are made for the indigent and for the hospitals. The golf unit is active; they meet monthly.

Our very newest activity was undertaken at your request at the 1931 meeting in Lexington. The request came to us, officially, from you through the Advisory Council. unfortunately, after the adjournment of our own meeting. It seemed a big undertaking in an entirely new field for Auxiliary work. At the request of the Advisory Council, I appointed Mrs. A. T. McCormack as Managing Editor and Mrs. C. H. Krieger as Business Manager of the Quarterly Supplement to the KENTUCKY MEDICAL JOURNAL, for which we have labored diligently to secure

funds for its support through advertisements secured from business firms, not an easy task during this last year, as I am sure you can readily understand.

We are proud of the distinction of presenting the first regular supplement to a medical journal, edited by women and edited, financed and managed by the Auxiliary. We hope this experiment has met with your approval.

In conclusion the Auxiliary is cognizant of the many courtesies which you have extended to us, for which we express our sincere appreciation.

Respectfully submitted,  
Mrs. G. A. Hendon, President.

A. T. McCORMACK: I am sure this report is a revelation even to the husbands of members of the Auxiliary who have made it possible, and I know it is a revelation to those of you whose wives have not had the privilege of participating in this important movement for the benefit of the people and for the medical profession of Kentucky.

Those of you who have read the Quarterly have been kept informed as to the aims and objects and ambitions of these women of ours. Some of you have taken it home for your wives to read; too frequently you have failed to do it, and your wives don't know about the things that these other women are having the privilege of doing for and with us.

I want to say to you as sincerely as I ever have brought you any message in my life that if you are depriving your wife or your daughter or your mother of the privilege of knowing your purposes and your objects and your aims and are preventing her from taking part in making them effective, you are not treating her squarely. These women are getting an amount of information and are transmitting it through the most approved methods of transmission to the thoughtful women leaders of Kentucky, and therefore you are not treating your people squarely, either. Their radio program, if they didn't do another thing but that is worthwhile. There are thousands of people who are listening in their homes to the quiet advice, the carefully worded advice, every week, of leaders in the profession, and there is no radio program that goes over WHAS that is more widely heard than the radio program that is sponsored by the Woman's Auxiliary and the spoken words of which come from the members of the profession here in Louisville and visitors to Louisville.

It would have inspired you to have been present at the meeting of the State Road Commission when they were requested that the road from the Jane Todd Crawford home to Danville should be recognized and marked as the trail over which that heroic woman



rode horseback to the great experiment that has made possible all the progress that has been made in modern medicine, where the model patient of all times met the great surgeon for the first time for the opening of the abdomen for the removal of an ovarian tumor. It would have inspired you to have been present and to have heard the generous recognition that came from those great men on the Commission who have not only named the trail but who have already made the necessary appropriations that that trail from her home to Danville be completed as a modern highway as a monument to that noble woman and to that great experiment, that piece of research work that was there done by McDowell. That Trail would neither have been trail, named, nor marked if it hadn't been for the Woman's Auxiliary.

There are a hundred things that I could take up your time for the whole afternoon telling you about that this small group of women have already done. I know how difficult it is in many instances for the wives to take the time from the important duties of their homes; I know how hard it is for those who have learned the attractive games of bridge and golf to be deflected from them, but I want to say to you that after they have once had the privilege of the sort of service that these noble women have had, that Mrs. Hendon has led and about whom she has so beautifully reported to you, when they have had the opportunity of once visioning that opportunity of service, they share with us better than they ever have done before the privilege we have of serving our people, and they are going to make us more effectively of service to our people because they are teaching them what we are doing, they are telling them about our aspirations, they are exposing to them the things that are in our hearts in our desire to make them healthier and happier and more useful people.

I want to appeal to the House of Delegates as I never have done about any other thing, that you go back to your counties and get your wives and the wives of your associates organized and banded together in your several counties to effectively do this work. If you accomplish that purpose I want to assure you that you will find in the improved support, the improved confidence that you will from month to month see evident in your people, repayment for the effort.

I would give anything if it were possible for me to tell you of what has been accomplished in Perry County, Kentucky, by the Woman's Auxiliary there; I wish I could take the time to detail it; I wish you could see in that rugged county what they have done where conditions are difficult in a way that they are not in many counties that were smoothed out by the great Master when He

was creating the world. It sort of looks like lots of piles of rocks were left in the way of human endeavor up there rather unnecessarily when the last day came, but in spite of that the doctors of that county and their wives have accomplished for their people results that have not been attained in the counties where there has not been such united effort.

In response to this, I think I can well say in view of the lovely character who has presented to us this beautiful report (because in words and terms and as a report of service it is a beautiful report), no more important matter is to come before this House of Delegates than your further consideration of the importance of establishing in your county an active Woman's Auxiliary.

At the meeting of the Council today we were carefully considering the importance of having the members of the legislature cognizant of the aims of the profession, that the cults and the crooks that would short-cut into the service of the people without being qualified might be stopped. I want to say to you that there wasn't a county in which there was a Woman's Auxiliary for the last five years that hasn't had a representative who represented everything that you stand for, not one, because the women saw that they were educated in a way that you haven't the time to do. They can't do it unless they are members of this organization and are securing from it the information that, relayed to the members of the legislature, will be of tremendous value to you every single, solitary day you live and practice. It is with that purpose in mind that I appeal to you again to go back home and help to make your wife a member of the Auxiliary. If she is the only wife in the county, help her to be a member. Help to get them all into the Auxiliary that we may have this devoted band of our women saying for us the things that they can say so much better than we can. Besides that, it is considerable of a relief to you to have them saying it to the public instead of saying it to you, because the public needs improvements very much more rapidly, and it is more willing to be improved than we are personally. I have found that the deflected energy in my own household which has been of great public benefit has been an enormous amount of private relief, as I am sure you will find also if you will indulge in the same activity. (Laughter).

PRESIDENT REDDICK: We are all pleased, I am sure, to have the Quarterly come to us every three months with the JOURNAL. We appreciate these splendid remarks of Dr. McCormack relative to the report of Mrs. Hendon, and the altruistic work that those fine ladies are doing in the county organizations.

We are pleased, Mrs. Hendon, to have you with us.

SMITHFIELD KEFFER, Grayson: I think Mrs. Hendon mentioned one thing that I am very much interested in, and that is the beautifying of our public highways with trees and shrubs. I would like to go a step further and say, when you are planting those trees plant nut trees. I talked to the state forester a few weeks ago about planting walnut trees, and he said it was very much better to plant the walnuts. I have seen, in my own short life, a great big walnut tree grow on my father's farm that I know is not any older than I am.

PRESIDENT REDDICK: We will next have the report of the Committee on Prevention of Goiter, R. R. Elmore, Chairman.

#### REPORT OF COMMITTEE ON PREVENTION OF GOITER

The other members of the Committee are W. I. Hume, Louisville, P. C. Sanders, Danville, J. N. Bailey, Paducah, J. W. York, Canmer. I have not had an opportunity of consulting these gentlemen relative to this report. I did not have an opportunity to get up a report and send to them in advance. If they have any variations on what I am going to say they doubtless will let you know about it.

This Committee was formed several years ago at the instance of Dr. McCormack, and then we formulated a certain plan or scheme for what we thought would reduce the incidence of goiter in Kentucky. There has not been anything develop during the last year to change that plan. I think it has a great many advantages over any scheme that has been advanced in any state. For instance, we recommended that a weekly dose of iodine be given to adolescent children. Of course, if a weekly dose of iodine is given it is given in the home. If that is not practical in any county, it might be given through the school, giving a dose every school day for two weeks twice a year during the stage of adolescence.

The question of the administration of iodine during the last weeks of pregnancy is a subject which has never received very much consideration. So far as I know it is not generally recommended, although the report in Detroit shows that out of all the goiters found in school children, twelve per cent were fetal goiters. If that is true, it certainly is well worth while to try the administration of iodine during the last four or five weeks of pregnancy.

Dr. Kimball, of Cleveland, has taken a very prominent role in the prevention of goiter. In his report issued last December he stages a drama which, if it were enacted on the stage, would be one of unparalleled attractions to the medical profession. He began with Detroit. He was enlisted by the Health Department of Detroit and secured the co-opera-

tion of the State Board of Health in Michigan, the City Health Board and the school board, the health physician, and also the medical societies in Detroit, to see if he could not bring about the reduction of goiter in Detroit, which is in the lake region where the incidence of goiter runs, in school children, about thirty-four per cent.

The method of attack that he recommended and that they followed was the administration of iodized salt. They enlisted the support of their grocery people and the salt producing people and fixed a certain minimum iodine content of all the salt that was sold in that county, Wayne County, which includes the City of Detroit. They made a census or a survey of school children and established an incidence of goiter of thirty-four per cent of school children in grades ranging from the primary to high school. They then confined the sale of salt to this iodized salt, and the reduction of goiter as shown by the examination of these school children, same ages, is shown by the following figures:

In 1924, the incidence of goiter was thirty-six per cent; in 1926 it was 9.7. There was then a steady decrease until 1931 when it had fallen to 2.1 per cent. Undoubtedly, as Dr. Kimball states, the rapid disappearance of endemic goiter among the school children throughout Michigan is one of the outstanding achievements of preventive medicine.

Dr. Kimball resides in Cleveland. The following year Ohio became interested in a similar way in the prevention of goiter. A survey was made in two southern counties, two middle counties and in Cleveland to establish the incidence of goiter in those areas. They arrived at the conclusion that goiter was just about as prevalent there as it was in Michigan, around thirty-four per cent. It was their intention to utilize iodized salt as a means of prevention. The following year, in 1926, a prominent surgeon of Cleveland published an article attacking the use of salt as a prevention of goiter, saying that it was increasing cases of hyperthyroidism, and so frightened the people of Ohio and alarmed the medical profession of his city that the State Board of Health withdrew their co-operation from this plan and the matter fell through.

Dr. Kimball made a survey as best he could in Cleveland to see how much reduction there had been. His conclusion was that instead of 2.1 per cent which prevailed in Detroit, it was still twenty to twenty-four per cent in Cleveland. While there was some iodized salt used in Cleveland, perhaps one-third of the community only was using it, and it was used in a haphazard manner and an imperfect



manner, so the result would not be proportionate.

So we have in the great cities of Cleveland and Detroit two opposing groups, equally ambitious, equally honest and devoted to the welfare of their communities, one saying that the iodized salt is a means of preventing goiter, while over in Cleveland they say it should not be used; in one city there is a prevalence of goiter of 2.1 per cent, and in the other it is over twenty per cent.

There is another feature that is brought out by that same test. It has always been the contention of your Committee on Goiter that toxic goiter bears a certain percentage of relation to the incidence of endemic goiter; that is, where there are a lot of simple goiter cases, there is a greater percentage of toxic goiter. That is proven by the figures which Dr. Kimball brings out. He ascertained the number of toxic patients admitted to the Henry Ford Hospital in Detroit and to two other hospitals in Detroit, and they have decreased at least fifty per cent. In Cleveland at the Lakeside Hospital, the number of toxic cases that were admitted in 1931 as compared with 1925 has increased, showing the definite relation between the two.

As I stated at the outset, our plan is not to give iodine indiscriminately, but only to give it to that element of the population that it might benefit. It does seem that it is questionable procedure to give iodized salt to every citizen of the state or city. Why not limit it to that element of the population that may be improved by receiving it?

Respectfully submitted,

R. R. Elmore, Chairman.

SECRETARY McCORMACK: If you will permit me to say a word about Dr. Elmore's report, one of the most remarkable institutions that ever came into the State of Kentucky has come in recently during the depression in the eastern and western coal mining sections of the state. There has been a service committee of the Friends' Service Society from Philadelphia. I think in many respects the most remarkable social service that has been accomplished at any place. There have been only about a half dozen of these people in the state. They have expended some \$200,000 in providing lunches for the school children in the sections where the children were evidently undernourished. It has been done without any publicity. I was privileged as a representative of the Governor a few days ago to go to Philadelphia and express the appreciation which the people of Kentucky felt to these people, and in talking to them I told them that while six of them had been in the state and had been in contact with our people for the last eighteen months, perhaps nobody in the state knew they were here. They reminded me very much of our

beautiful bird the thrush, that you see sometimes fly across the road, but you are constantly charmed with its wonderful song. In the same way we have seen our children fed in large numbers.

One of the interesting things that we have done has been to use iodized salt in all of the feedings that have been done, at our suggestion, because of the incidence of endemic goiter in the southeastern section of the state. It has been a very interesting thing to have the school teachers and the physicians in the localities where they have served, tell us that there is no question that since these luncheons have been given to the children there has been a decrease in endemic goiter in that section. It bears out the recommendations of Dr. Elmore and the splendid work that he and his committee have done in our education over these several years.

The State Board of Health of Kentucky is recommending and urging upon all our jobbers and wholesalers that they purchase only iodized salt, and in so far as it is possible to do it, we are providing it for the people of the state. We feel that there is no question but that the data submitted as to the relative use of this material in Michigan and in Ohio is conclusive, and we are perfectly willing to go on record to our people that iodized salt is a safe product as a regular food. Of course, nobody who is sick should take any kind of medication without the advice of his own family physician in that particular case, and as soon as any child shows any kind of deviation from the normal it should be under the control of its own physician and that physician should determine all the medications that should be given to it. We recommend no medication for sick people at any time in general. Recommendations of that kind should be made through medical journals and should not be made through any avenue of public information because it does not apply.

S. C. SMITH, Ashland: I have had the privilege of hearing Dr. Crile and Dr. Crowley discuss this goiter subject at length, and they have agreed on one thing only in the whole discussion, and that is that adolescents should have iodized salt and that adults never should have it, that it does bring on activity in certain adults without any previous evidence of goiter, if they had it before they didn't know it, but the constant use of iodized salt caused many adults to show signs of hyperthyroidism with thyrotoxicosis that had no symptoms previously.

I respect the opinion of these men because they both have made a study of it, and I do believe that children need it but adults had better let it alone.

PRESIDENT REDDICK: We will be pleased now to have the report of the Committee on

the JOURNAL, by D. Y. Roberts, Chairman.

#### REPORT OF COMMITTEE ON THE JOURNAL

Mr. President and Chairman, I have had only since Thursday to get up this report, and it is going to be very short and sweet. I have not had a chance to compare our JOURNAL with any other state journals at all. I couldn't tell you how it compares with them. I could tell you in my opinion what would improve the JOURNAL a great deal. If we stop taking advertisements from these advertising optometrists (if I am wrong in the word I don't know what the word is) and have more original papers in the JOURNAL from men out in the state practicing medicine every day, and have them give us their own personal opinion of things instead of filling up pages with references and statistics, and so forth, real papers by men who have had the experience and know what they are talking about, it will be a better JOURNAL. We all have reference books in our offices; we don't need all those references.

Another thing is that I believe in cutting down the space of the Woman's Auxiliary. If you are going to run a Ladies' Home Journal, run a Ladies' Home Journal; if you are going to run a medical journal, run a medical journal.

Respectfully submitted,

D. Y. Roberts, Chairman.

A. T. McCORMACK: I thoroughly agree with everything that Dr. Roberts has said. He is a little late about what he said about the Woman's Auxiliary, because we give no space to it in the JOURNAL any more. It publishes its own Quarterly.

D. Y. ROBERTS: Look at this month's issue.

A. T. McCORMACK: There is nothing in the JOURNAL about it except an editorial.

D. Y. ROBERTS: Pretty nearly a page and a half. That's space.

A. T. McCORMACK: The difficulty we have about securing papers from the practitioners of the state is one of the most important things, and I am glad Dr. Roberts has brought it up. For twenty-seven years there has not been one single paper sent to the JOURNAL in the State of Kentucky from any county society that has not been printed in the JOURNAL—not one single one. Some of them have been mighty bad, I know that, but they have all been printed, every one of them. A lot of them have been good, most of them have, and they have been increasingly good. That is one of the things in which the profession can take pride.

At least once every year for twenty-seven years a letter has gone to the secretary of every county society in the state telling them how many papers have come from the various county societies and urging them to have their members prepare their papers and send them in for publication. We are going to continue

that policy and we are going to print all the papers that come in. We want your help and co-operation.

I have given instructions that no more bibliographies will be published in the JOURNAL under any circumstances, and I am glad Dr. Roberts called attention to that. The Catalog of the Surgeon-General's office of the Army published every year a supplement to its Index Medicus that is sufficient to give all the bibliography in the world, and anybody who wants any bibliography anywhere can go and get that and get ten times as much as we can afford to publish. No more bibliographies are going to be published in the JOURNAL at all. It is expensive, a nuisance, nobody but the author ever reads it, and he reads it only because he has to read the proof.

The references and quotations that come from authors are all right; it is proper to indicate the reference supporting your thesis in the matter, but to publish a long bibliography at the end of an article is a waste of valuable space, I believe, because these things are always available to all of us.

I am always glad to have the frank and honest comment of a man like the Chairman of the Committee on the JOURNAL this year, because it is only by securing those comments that we can make the JOURNAL conform to your wishes in the matter. It is your JOURNAL, you publish it, you patronize the advertisers and make its publication possible, it is yours, and unless you tell us what you think about it, it is absolutely impossible for us to get any results in regard to its improvement.

L. H. SOUTH, Louisville: In regard to the space allotted to the Woman's Auxiliary this month, we had 43,000 lines in the Annual Number, and of the 43,000, twenty-six lines were devoted to this organization.

D. Y. ROBERTS: That is twenty-six too many.

E. R. PALMER, Louisville: I don't like to disagree with my friend Dr. Roberts, but it seems to me that we doctors have a great deal to depend upon our women for, and I am rather surprised that our JOURNAL has only twenty-six lines referring to the Woman's Auxiliary. I think we ought to have 2600. I think if there is anything in the world that makes a man successful it is the backing up of his efforts by his women folks. I think the greatest move that the Kentucky State Medical Association ever made was down there at Crab Orchard when they organized the Woman's Auxiliary. We have too long looked upon this world as a man's world. It is not a man's world; it is a man's and a woman's world, and I believe it is more of a woman's world than it is a man's world. (Applause).

I looked over the Quarterly, and I was wonderfully impressed with the history that



they had gotten up of what the doctors had done. None of us men have ever done anything like that.

As I say, I am rather averse to objecting to my friend Roberts, but I don't believe we can give the women too much space, not only in their Quarterly, but in our regular JOURNAL. (Applause).

SECRETARY McCORMACK: I have a report here from the Committee on Commercial Exhibits:

Your Committee on Commercial Exhibits begs leave to call the attention of all officers and members of the House of Delegates of the Kentucky State Medical Association to the usual high-grade commercial display which has been an attractive and interesting part of our annual meetings for many years, and which is this year located in a situation easily accessible to all in attendance.

These exhibitors pay a considerable proportion of the expense of our annual meetings, and we trust that all of you will keep the exhibits in mind and pay a visit to them at such times that will not interfere with your interest in the scientific program.

Your Committee gives its full assurance that all of you can be at least this much commercially inclined without being accused of commercialism, and the only compensation we received for our service on the Committee is the immediate net profit on all free samples distributed to the members and guests of the Association.

W. E. Gardner, Chairman  
W. M. Martin  
C. C. Howard.

I want to call your attention especially to the splendid scientific exhibits which have been arranged by Dr. Hayes Davis and Dr. J. Duffy Hancock. They contain exhibits of particular interest that I know you will want to see yourselves and will want to carry back home with you.

I have here the report of the Committee on Hospital Standardization:

Your Committee on Hospital Standardization reports three hospitals closed during the past year, leaving eighty-four in service, with a total bed capacity of 3179 and average patients 2555, or 80 per cent occupancy.

The insane hospitals show:

	Bed Capacity	Average Patients
Eastern	900	1622
Western	1500	1702
Central	1750	2199
Total	3150	5523

This is a lamentable state of affairs showing great over-crowding. It is time that the profession made a distinction between a real hospital, giving high-grade service the sick, and a nursing home. So many of the smaller hospitals have not the facilities nec-

essary to successful hospital operation of the present day. Those hospitals which are acceptable for nursing requirements and for internships meet all the demands for good service.

Our attention has been called to the fact that in some cities of the second class, graduates of substandard schools are accepted, which does not lead to efficiency.

J. D. Northcutt, Covington  
J. M. Salmon, Ashland  
W. A. Weldon, Glasgow  
W. B. McClure, Lexington  
J. Garland Sherrill, Louisville,  
Chairman.

PRESIDENT REDDICK: We will now have the report of the Business Manager of the JOURNAL.

L. H. SOUTH, Louisville: This year in the JOURNAL we published sixty-seven more articles than in any previous year. In spite of the depression and all the financial troubles widely prevalent, we made some profit on the JOURNAL.

This year I have completed the collection of all of our Past President's pictures. I had all except one, and I have been working on this for six years. This year I received the picture of Dr. Thomas of Hopkinsville. I hope that as soon as the Association is financially able that these pictures can be remade (some of them were taken in 1851).

Part of my duty as Business Manager is to arrange county medical society programs, and I have been extremely fortunate this year in securing speakers and in having splendid medical meetings. In most small counties, for instance like Larue where there are about eight physicians, we have a meeting of the county medical society, but we invite all the doctors in the surrounding counties to the meeting. Even if we have only four doctors in the county, I believe we should have a meeting, because those four doctors take care of at least 10,000 people. That is the minimum number of inhabitants occupying a county. Regardless of the small number of doctors in the county, I believe the Councilors should do this work.

We are arranging a speakers' bureau and are asking the Jefferson County Medical Society, the Fayette County Medical Society and the Campbell-Kenton Society to supply us with the speakers for their sections of the state, and they have responded very beautifully.

The JOURNAL is taking care of all the papers that come to the office. The doctors are writing better articles. I think we should congratulate ourselves that we do publish every item that is sent to the JOURNAL. The JOURNAL is the mouthpiece, as it were, of the Kentucky State Medical Association. If you are a member of it and write an article and

that article is not very good, you will soon hear about it from different sections of the state.

The office of the JOURNAL will arrange for the meeting, arrange the program, send the letters to the secretary, who signs them and sends them out. We supply the Councilors and Secretaries with a list of members and non-members, and give them every assistance possible in maintaining their organization, our office is for service to the doctors in Kentucky.

PRESIDENT REDDICK: I notice that Dr. Abell and Dr. Simpson have come into the room. They are delegates to the American Medical Association and we would be glad to have a report from them.

VIRGIL SIMPSON, Louisville: Mr. President and Gentlemen: Somewhat in conformity with the request of the Speaker of the House of Delegates of the American Medical Association, I thought it would be wise for you to know something of the activities of that body.

In the organization of the House of Delegates of the American Medical Association, Article 5, Section 3, provides that the "total voting membership of the House of Delegates shall not exceed 175."

Since the Medical Departments of the Army, Navy and Public Health Service, as well as each scientific section of the A. M. A., are each entitled to one delegate, the remainder must be apportioned among the constituent state associations "in proportion to their actual active membership." This apportionment of delegates is made every three years by the House of Delegates through a Committee on Apportionment, and is based on the membership of each state association as of April 1st of each apportionment year. A delegate's credentials are approved by a Committee on Credentials and when once seated his place cannot be taken by another delegate or alternate.

All elective officers of the A. M. A. are elected by the House of Delegates, and all nominations for such officers originate in the House except the Treasurer of the A. M. A., whose nomination is made by the Board of Trustees. No member of the House of Delegates is eligible to the office of president or Vice-President of the A. M. A. The necessity of this provision was made apparent.

#### BUSINESS

The business of the House of Delegates is expedited by the agency of committees; standing committees are nominated by the President of the A. M. A. and elected by the House of Delegates; reference committees and special committees are appointed by the Speaker of the House of Delegates.

At the last meeting of the A. M. A. there were eleven reference committees and sixty-

six committee assignments. Any delegate may appear before any committee dealing with referred business and lay before it his views on the matter under consideration. Through having a problem considered in committees and hearing evidence in support or refutation of a proposed action, much time is saved the House of Delegates and business expedited. Recommendations of committees are thus the result, usually, of information and discussion and are rejected by the House with relative infrequency. Notwithstanding this, it occasionally happens that the action of the House of Delegates has resulted in embarrassment to the Association.

#### RESUME OF ACTION AT NEW ORLEANS

MEMBERSHIP. The Secretary of the A. M. A. reported a membership as of March 1, 1932 of 99,470. 546 new members were added in the year 1931, and 1411 died. The 1931 Directory of the A. M. A. lists 159,109 physicians in the United States and its territories. This includes the inactive, retired, all-time teachers, research workers, internes, and all ineligible, for one or another reason. The roster of Fellows of the A. M. A. as of March 1, 1932, numbers 64,712.

FINANCIAL. The Board of Trustees reported an income of \$1,828,784.92 and an expense of \$1,599,131.20, a net income of \$229,653.72. The Association has property and equipment valued at \$999,260.00. It has investments valued at \$1,810,991.28; it has cash on hand of \$260,112.36. It has accounts and notes receivable amounting to \$252,348.94. The total net worth of the A. M. A. as of December 31, 1931, was \$3,032,023.35. There has been set aside a reserve fund of \$250,000.00 and a building fund of \$750,000.00. It may not be generally known by the profession that a building for the general offices of the Association is now contemplated by the Board of Trustees. It may also be of interest to know that the salary budget of the Association for 1931 was \$451,158.11, a paltry \$58,841.89 less than one half million dollars. The Association spent \$19,037.55 for health and public instruction; \$66,728.93 for medical education and hospitals, and \$29,197.08 for legal medicine and legislation, while it was spending only \$3,584.06 for therapeutic research.

Your delegate thinks this House of Delegates will find peculiar interest in the following statement, having in mind the total net worth of the A. M. A. is now \$3,032,023.35. The South Carolina State Medical Association directed its delegates to the A. M. A. to present a resolution reducing the subscription rate for the Journal from \$7 to \$5. The resolution was introduced, was referred to the Board of Trustees, which reported that it "was not deemed wise or expedient to make-



any reduction at the present time." That opinion of the Board was translated into a motion for adoption by an Ohio delegate, seconded by one from Nebraska, and carried. Your JOURNAL will continue to cost \$7 per annum. I believe it is worth it, but I favor the reduction temporarily. I see no reason for piling up reserves at the present annual rate that the officers of the Association may be housed in quarters our membership cannot afford to equal for themselves or to further increase a reserve fund for possible contingencies while the rank and file of the profession find it difficult even to carry on. The net income for the A. M. A. for 1931 was \$229,653.72. Of this accomplishment the Reference Committee on Reports of the Board of Trustees and Secretary headed by W. F. Braasch, Minnesota, said in its report: "We note with approval that the management of the Association has been able to report a surplus this year in spite of generally existing financial distress. Although the conservation of financial resources by our Association is to be commended, the question may well be asked, what is the object of further accumulation? \* \* \* \* \* The surplus has reached a point where accumulation seems to be no longer necessary." That part of the Reference Committee's report was deleted on motion of a delegate from California. The Secretary of the A. M. A. participated in the discussion that preceded the vote for deletion and evidenced marked irritability at the Committee's comments. It would seem that an honest difference of opinion is construed as lese majeste. The Board of Trustees forsook its dignity, hastily drew up a defense which contained the following admonition to the House of Delegates: "It is important to point out to the House of Delegates that the Board of Trustees is the only body authorized by the charter of the Association and by law to administer the funds of the Association. In the administration the Board is glad to have the advice of the Reference Committee, but it cannot delegate its responsibility."

#### QUARTERLY CUMULATIVE INDEX MEDICUS

This has been published by the A. M. A. with the co-operation of the Carnegie Institution and the Army Medical Library. With the close of 1931 co-operation of both the agencies was withdrawn. The Board of Trustees did not advise the House of Delegates the reason for this discontinuation. The index is now published by the A. M. A., and an additional 500 journals had to be subscribed for. The Index was published at a deficit of \$29,533.49. In 1931, 2,182 copies of the Index were sold.

#### PACKAGE LIBRARY SERVICE

The House of Delegates approved the continuance of this service by the Board of

Trustees. More than 7,000 copies of periodicals were lent to physicians during 1931. There are available for 1932 some 1,200 periodicals which doctors may borrow. Over 2,400 package libraries were furnished doctors in 1931. This service increased about 20 per cent over the previous year. It makes it possible for a doctor in rural communities to have available literature on any subject in which he may be interested. Each package contains 10 to 30 reprints and journals.

#### BIRTH CONTROL

A resolution was introduced into the House of Delegates providing for the appointment of a committee to study birth control. This resolution was considered at the executive session of the House, when, after very little discussion, the Reference Committee on Executive Session reported that "this is a controversial subject and the Committee believes that it would not be advisable at this time to inject this subject before the profession. The Committee therefore disapproves the adoption of the resolution." This report was adopted as a substitute for the original resolution.

#### NOMENCLATURE OF DISEASE

A resolution was presented providing that the American Medical Association through its House of Delegates approve the Standard Classified Nomenclature of Disease as compiled by the National Conference on Nomenclature of Disease. The National Conference on Nomenclature of Disease is composed of delegates from clinical societies, some of them national in scope, with certain other interested organizations, including a delegate from the American Medical Association. This resolution was referred to the Committee on Hygiene and Public Health, which committee later recommended in its report that the question be referred to the International Bureau of Vital Statistics. The recommendation was lost and the House voted favoring the endorsement of the preliminary draft of "a Standard Classified Nomenclature of Disease."

#### REPRESENTATION OF THE UNITED STATES VETERANS' BUREAU IN THE HOUSE OF DELEGATES

An amendment to the Constitution and By-laws was submitted by a delegate from New Hampshire, which provided that the Medical Director of the United States Veterans' Bureau be made a member of the House of Delegates. The proponent of the amendment argued that the Medical Departments of the Army and the Navy were each entitled to a delegate in the House and that the Veterans' Bureau should be placed on a plane with these departments. The opponents of the amendment argued that in the pro-

vision for representatives of the Medical Department of the Army and Navy in the House, no one member was designated to serve as delegate, but that the appointment was left to the Surgeon General of each department, whereas the proposed amendment designated that the Director of the Veterans' Bureau be the delegate, regardless of his classifications. It was further argued that only about one-fourth of the entire number of full-time doctors who are connected with the Veterans' Bureau hold membership in the American Medical Association, and further that the doctors engaged in the service of the Veterans' Bureau are distributed among forty-one constituent associations of the American Medical Association. The resolution was referred to the Committee on Amendments to the Constitution and By-laws, which recommended disapproval of the proposed amendment, and this recommendation was adopted by the House.

#### BUREAU OF MEDICAL ECONOMICS

This Bureau was authorized at the Detroit meeting in 1930 and Dr. R. G. Leland made Director on its establishment in March, 1931. The purposes of this Bureau are:

(1) To collect, tabulate, study, criticize and prepare for publication and distribution data pertaining to the economics of the practice of medicine; (2) to furnish critical and constructive informations and opinions on the several phases of medical economics; (3) to encourage the adoption by individual physicians and medical societies of modern sound ethical business methods; (4) to urge medical schools to provide medical students with information concerning the economics of medical practice and an outline of essential business principles which should be incorporated early in individual practice; (5) to develop, ultimately, a consultation service with respect to medical business methods.

This may sound rather vague as a program, but when it is understood that the above generalized statement of functions is meant to embrace the collection of data on such phases of medical economics as capital investment, care of indigent sick, collection methods, contract practice, industrial medicine, health and accident insurance, workmen's compensation, panel systems, sickness insurance, savings, statistics and financing, group practice, public health activities, dispensaries and clinics, distribution of medical facilities and physicians, fees of and insurance for physicians, one begins to realize the real scope and potential value of such a Bureau's activities. Had such a Bureau been functioning in 1928 it would have made either easier or unnecessary the work of the Committee on the Cost of Medical Care. The scope of this latter committee is general in

its purpose, study and conclusions; it is interested in the incidence of disease and disability, the cost of the care of the sick and disabled, and an analysis of the facilities available for such care. The scope of the Bureau of Medical Economics is ultimately as broad as that of the Committee on the Cost of Medical Care and is infinitely more detailed in its premises. The one views the problem from the nation's requirements standpoint, the other from the standpoint of the profession that has discovered all the means of relief from disease and accident and devotes its life to rendering that service. As your delegate, I feel this work should have my support.

#### CHANGE IN NAME OF SECTION

At the Philadelphia Session in 1931 the House of Delegates approved changing the name of the Section on Diseases of Children to Section on Pediatrics. At the New Orleans Session the House voted the necessary changes in the By-Laws to make change in name possible. To the casual observer the term "pediatrics" is synonymous with "diseases of children" and probably will continue to be. But to those interested in this field such a view is considered archaic. They define pediatrics as that branch of the medical sciences which has to do with the factors which influence the growth and development of the individual from birth to maturity (Veeder). This definition, it will be seen, embraces heredity, environment and disease. It includes the mental as well as the physical aspect. This definition seems to reflect the general conception of current medical thought, the scope of current medical pedagogics, and is the interpretation on which the study and report of the White House Conference on Child Health and Protection is based.

#### ESSENTIALS FOR ADMISSION TO LIST OF PHYSICIANS SPECIALIZING IN RADIOLOGY

The Council on Medical Education and Hospitals presented its recommendations covering the "Essentials for Admission to List of Physician Specializing in Radiology" and requested the House to approve them. In 1929 the House of Delegates approved the recommendations of the Council on Medical Education and Hospitals, covering the "essentials of an approved department of radiology and roentgenology." In order to more satisfactorily classify such laboratories, the Council recommended that the House of Delegates establish some fundamentals governing radiology as a specialty and that a list of such physicians be required to be eligible for admission. For such a list it was proposed that a candidate possess the following qualifications:

(1) That the candidate shall be a grad-



uate of an approved medical school and licensed to practice medicine in the state where he is located;

(2) That he shall have had approved special training at an acceptable school, hospital or clinic or under an accepted preceptor for a period of three years, or, in lieu thereof, five years' experience in the exclusive practice of radiology;

(3) That the department which he heads or that independent laboratory which he conducts shall be equipped to carry out properly the technical procedures or activities required by the Council;

(4) That the physician practicing radiology shall be subject to the same rules of special training and conduct as govern his fellow specialists and that the principles of medical ethics shall apply in all of his relations;

(5) That roentgenography constitutes only a kind of medical examination and as the opinion of the specialist is the essential factor, the introduction of roentgenograms as evidence in medico-legal cases should be discouraged as immaterial and as tending to adulterate the processes of justice;

(6) That the requirements for protection of patients, attendants and persons in or near the laboratory as recommended by the International Congress of Radiologists and approved by the American Roentgen Ray Society and the Radiological Society of North America shall apply in arrangement of laboratory and construction of apparatus;

(7) That suitable records shall be kept and roentgenograms stored, to be kept as long as there is possibility of their being needed for the benefit of the patient or his physician;

(8) That physicians desiring to make application to be admitted to the approved list shall apply to the Council on Medical Education and Hospitals of the A. M. A.

The recommendation of the Council on Medical Education and Hospitals, of which the above is merely an abstract of its essentials, was unanimously approved by the House of Delegates.

A similar standard for pathologists was presented and approved.

The "Essentials of an Approved Clinical Laboratory" were adopted in 1923. The total accepted to date is 421; the total accepted on the list specializing in radiology to date is 1,003.

#### THE SURGEON GENERAL'S LIBRARY SITE

At the annual meeting of the A. M. A. in Philadelphia, June, 1931, the House of Delegates passed a resolution advocating the building of the new Army Medical Library building adjacent to the Library of Congress. At the 1932 meeting in New Orleans, Surgeon General Patterson, U. S. A., requested

permission to discuss the matter before the House, and, permission granted, he emphasized the objections set forth by the Medical Department of the Army against the proposed location on the grounds of cost and accessibility. Following his remarks, another resolution was introduced rescinding the action of the House in Philadelphia, which carried unanimously. I am not sure that the action of the House in 1932 was any better advised than its action in 1931. I rather feel that it is a matter about which the House of Delegates as a body knows nothing and that it had better have taken no action in the matter either year. However, the Surgeon General and those members of the Medical Department of the Army who see the matter as he does, were satisfied.

#### VETERANS' LEGISLATION

The story of the A. M. A.'s interest in veterans' legislation is somewhat involved and rather long. In 1931 the House of Delegates recommended that the Board of Trustees appoint an auxiliary committee on veterans' legislation to act with the Committee on Activities. Such committee was appointed, and from September, 1931, to the time of the New Orleans meeting, these joint committees continued to function actively. They held meetings with officers of the American Legion and representatives of the American Hospital Association, in Chicago in September, Indianapolis in November, Chicago in December, and in Washington in January, 1932. At this last conference the American Legion was represented by its Rehabilitation Committee and its Medical Advisory Council of Veterans' Administration. The net results of the year's work may not appear as very tangible, but at least a working liaison with the Legion has been established and considerable educational work has been carried on. When one realizes that there are approximately 10,000 Legion posts in this country, the possibility of contact with even a majority of them will require considerable time.

The following summary may be made as a fair statement of the situation up to the present time.

1. The A. M. A. has established through the Board of Trustees a standing committee which is co-operating with similar committees from the American Legion, the American Hospital Association and the Veterans' Administration.

2. The profession, and especially the doctors who are active Legionnaires, has been stimulated to an interest in federalized medicine and are emphasizing its dangers to the veteran and the country at large.

3. State Medical Journals have been enlisted in the effort to secure really helpful

veterans' legislation. I find myself in sympathy with this activity of the A. M. A. The World War Veterans' Act of 1924, as amended in 1926 and 1930, should be further amended. As the Act now operates, the Government undertakes to furnish hospitalization and necessary traveling expenses to veterans of any war "without regard to the nature or origin of their disabilities." The Act also provides that every honorably discharged veteran of any war with ninety or more days of service is entitled to "benefit for disabilities not resulting from injury or disuse suffered or contracted in military or navy service." The benefit referred to may be a cash payment of \$12.50 per week during any period of total disability" or a "hospital benefit of \$4 per day during any period of actual and necessary hospitalization."

The resolution now before the House of Delegates of the A. M. A. calls for "the cessation of the hospitalization of veterans with non-service connected disabilities" with certain exceptions, and further provides "that the veteran himself shall have the right to select his physician and hospital" subject to reasonable regulations of the Veterans' Bureau.

That the officers of the A. M. A. are in accord with the spirit of this resolution is evidenced by the following extract from the address of President E. Starr Judd before the House of Delegates at New Orleans.

"The medical profession is willing and anxious to see that the best medical attention possible is provided for them (war veterans). It wants them to have exactly the same care that all other orders of society are given. It does not want them to be pauperized and be placed in hospitals when they are not sick. \* \* The Federal Government has built enough hospitals. There are unoccupied beds in civilian hospitals that might well be used in the care of veterans who are sick."

The report of the Director of the Veterans' Bureau for the year ending June 30, 1931, showed that 52 per cent of the World War veterans under treatment in veterans' hospitals were there on account of diseases and conditions not connected with the service, that approximately three of every four general medical and surgical patients, one of every two tuberculous and one of every four neuropsychiatric patients admitted during the year did not have service-connected disability. Further, the report showed that 76 per cent of all admittances for the year had diseases and injuries not traceable to war service. Yet in the face of all this the Congress March 4, 1931, appropriated \$20,877,000 for the construction of additional veterans' hospital facilities. This orgy of building unnecessary hospitals continues, notwithstanding the survey of the Council on Medical

Education and Hospitals of January, 1931, showed there were 114,510 unoccupied beds in 3,902 hospitals in the United States. The hospitals of the Veterans' Administration have 28,454 beds. There is a total of 69,170 beds in all of our federal hospitals as of December 31, 1931. In addition to the beds in the Veterans' Administration hospitals, there are also 6,537 beds in Veteran" Administration homes. There is a total of 291 federal hospitals in operation. There are thirteen states in the Union which do not have at least one Veterans' hospital, while in New York there are four, and in California, Illinois, Massachusetts, Missouri and Pennsylvania there are also 6,537 beds in Veterans' Administration hospitals does not appear to be adapted to the care of veterans in case of acute illness or accident. The Government has spent \$6,000,000,000 and the number of non-service cases treated in Government hospitals has increased from 17.24 per cent in 1925 to 47.9 per cent in 1931, according to statistics computed by the National Economy League.

That physicians are not actuated by selfish motives in their opposition to the operation of Veterans' legislation is evidenced by the fact that 30,000 doctors are themselves former service men.

#### AMERICAN MEDICAL DIRECTORY.

Seven thousand, nine hundred ninety-two copies of the 12th edition of the American Medical Directory and a net profit of \$3,724.53 was realized. It would appear that the cost of the Directory is not too high. My personal subscription each year for a copy has afforded me much satisfaction as to the accuracy and extent of information desired.

#### PATENTS AND PERQUISITES

The Judicial Council in its report to the House of Delegates said in part:

"For several years the Judicial Council has given exhaustive consideration to suggestions to the effect that the Section of the Principles of Medical Ethics dealing with 'Patents and Perquisites' should be changed to permit physicians to secure patents on products of their inventive genius. After having given much careful thought to this matter, the Council sought the opinions of a relatively large number of representative physicians in various parts of the country. Responses received indicate an overwhelming sentiment to the effect that there should be no change in the present provisions of the Principles of Medical Ethics with respect to patents."

This was referred to the Committee on Rules and Order of Business, which reported back its recommendation that "the present Principles of Medical Ethics is adequate and should be strictly adhered to in dealing with 'Patents and Perquisites.'"

The House unanimously approved the recommendation.



## OFFICERS

The following officers of the A. M. A. were elected by the House of Delegates.

President-Elect—Dean Lewis, Baltimore

Vice-President—Rudolph Matas, New Orleans

Secretary—Olin West, Chicago, (re-elected)

Treasurer—Austin A. Hayden, Chicago, (Nomination by Board of Trustees confirmed)

Speaker of the House of Delegates—F. C. Warnshuis, Grand Rapids, Michigan

Trustees—Arthur W. Booth, Elmira, N. Y., Rock Sleyster, Wauwatosa, Wis.

## PLACE OF MEETING

Milwaukee, Wisconsin, was chosen as the place of meeting for 1933.

Respectfully submitted.

Virgil E. Simpson.

PRESIDENT REDDICK: You have heard this splendid report of Dr. Simpson. Does anyone wish to discuss it? Dr. Abell, we will be glad to hear from you.

IRVIN ABELL, Louisville: I think that is a most excellent resume of the work done at the New Orleans Session, which has just been given to you by Dr. Simpson.

The first order of business at the House of Delegates consists usually of the address of the president and the President-Elect. President Judd emphasized particularly the responsibilities of the doctor in carrying out the functions of the medical profession, secondly postgraduate training, thirdly specialism, which, by the way, has come to occupy a rather important part in the consideration of the Council on Medical Education, and fourthly, the hospitalization of the World War Veterans, to which Dr. Simpson has just alluded.

Dr. Cary, President-Elect, spoke particularly about postgraduate training and about medical economies. As Dr. Simpson has indicated to you, this latter subject looms large in the field of medicine in this country, notice of which has been taken by the American Medical Association House of Delegates in the formation of a Bureau on Medical Economics.

I question very much, however, whether it will ever have the amount of money at its disposal for the conduct of its studies that the Committee on Medical Care has had. That part of that has been done by means of contribution from the American Medical Association and the total amount so far available to the Committee on the Cost of Medical Care for its studies has been \$1,000,000. Whether or not our Committee of the American Medical Association will have anything like a similar amount I doubt.

The question of medical economies, as I say, has loomed large. If you take the records of the various houses of delegates in this

country, you will find that they are considerably interested in it. A very excellent paper has come from the House of Delegates of the California State Association in which they made some very concrete suggestions, which, however, will necessitate the expenditure of a considerable amount of money, the source of which is at present not at hand.

Dr. Simpson has referred to the work of the Council on Medical Education. I should like to add just one or two points which come to my mind in that report. He spoke to you of the work they had done in standardizing, if one may use that term, in defining the standards which must be reached by men who wish to specialize in radiology, as well as by men who wish to specialize in the conduct of clinical laboratories.

In their recent report they have also added to the standardization of hospitals, the various standards which must be attained by hospitals of fifty beds or under, and are actively prosecuting that work at the present time.

An interesting thing in connection with their studies of medical schools shows that the average number of graduates in this country at the present time is about 4,000, and the average number of deaths in the profession in this country at the present time is about 3,000, so that there is an excess of between 800 and 900 graduates entering practice each year over the number of deaths that occur in the profession each year.

They are at present endeavoring to form some standard or some qualifications for men who wish to engage in specialism of any sort or kind. There are certain societies in this country, notably the ophthalmological society, the obstetrical and gynecological association, and at the present time the American Urological Association is adopting such measures, which prescribe certain qualities to be possessed by the individual who is to be recognized as a specialist in those particular branches. The Council on Medical Education is collecting data from not only these three associations, but from all available methods of practice, to the end that in the near future they hope to recommend to the House of Delegates qualifications which must be possessed by an individual who essays to assume the role of specialist in any particular branch of medicine.

I think Dr. Simpson has given us a most interesting account of the meeting, and in listening to that you have some idea of the tremendous amount of work that is done by the House of Delegates of the American Medical Association.

He told you of the financial aspect as revealed by the report of the Board of Trustees. It is rather interesting that the gross income from the Journal of the American

Medical Association runs about \$1,730,000 a year and that the gross cost of operating that Journal is \$1,000,000, leaving a net profit from the Journal alone of over \$700,000 each year. A goodly portion of this is expended in various Association activities, possibly amounting to something more than \$400,000.

If you will consider that the House of Delegates is in session but three days, unless called upon for some special work or executive session, you will appreciate, as I say, the immense amount of work which is done and could only be accomplished by the splendid executive ability of its officers and by having the work done by committee assignments. It would be a matter of utter impossibility to consider these various things on the floor of the House of Delegates unless they had been considered in committee assignments to which every member of the Association has access, to which he may go and express his opinions, argue for or against a proposed policy or a proposed resolution, so that ultimately the committee boils down that work into an assimilable language and words and presents it at the next meeting of the House when it will be in such a clarified form that it can be acted upon intelligently and expeditiously.

A. T. McCORMACK: Mr. President, I think we owe a debt of gratitude to both Dr. Simpson and Dr. Abell for their clear exposition of the difficulties and of the enormity of the organization of the American Medical Association.

One thing Dr. Simpson reported that I think deserves especial notice from this Association. Of course, I had the privilege of a very intimate knowledge of the methods and purposes of the reorganization of the profession when it occurred back in 1903. The House of Delegates is the legislative and supreme body of the Association. It has absolute control of everything that the Association does, just as this House of Delegates has of the affairs of this Association. However, a few years after the Constitution was adopted, a very shrewd gentlemen who was at that time on the Board of Trustees conceived the idea that the Association in its charter must be chartered as an Illinois corporation, and in the charter it was provided that the Board of Trustees as the Board of Directors under the Illinois constitution and statutes should have control of the financial affairs of the Association. It was stated very clearly at the time, however, that this was merely to comply with the law, and that the Board of Trustees would always be under the control of the House of Delegates which, of course, is the representative body of the profession.

There has been a gradual usurpation of the powers and obligations of the House of Delegates by the Board of Trustees, which is ac-

centuated and emphasized by the action which was taken evidently at the New Orleans Session, which was the first session I have not attended for many years.

That is a state of affairs that ought not to be permitted to continue. The Board of Trustees is composed of very distinguished men, practically every one of whom have been for many years members of the House of Delegates. They are fed on no meat that is not the common food of all the profession, and they attain to no distinction and no power of observation or of decision that is not common to the rest of us. They do have the opportunity for a more intimate knowledge of the affairs of the profession, its business affairs, and its policies, but the time should never come any more in the government of the medical profession of America that it is to be controlled by a few than the time should come in the affairs of the United States when its representatives in Congress should be controlled by its Executive Department or, to bring it home to us, than the affairs of medicine in Kentucky should be controlled by any small group of people rather than by the representatives of the medical profession of Kentucky as assembled in its House of Delegates, because if we are to preserve the character of our organization, and in preserving its character preserve the character of our profession we are going to do it only in proportion as that control is a democratic control, as is exercised by the genius of our government, and that is the thing that is reflected in the splendid organization of the American Medical Association.

I hope this Association will authorize its delegates at future meetings of the American Medical Association to insist on the supremacy of the House of Delegates of the Association and that its findings shall not merely be recommendations to the Board of Trustees, but that its findings shall be compelling upon the Board of Trustees and that the Board of Trustees shall carry out those instructions and that every executive officer of the Association shall do the same thing.

I think when the time comes that we fail to do that we will revert in type to the old useless organizations that used to meet and pass resolutions annually, and Lord knows there are volumes and volumes of resolutions passed by the American Medical Association throughout all its years, when all its members had the privilege of voting in a body and when only those with loud voices (that was before the days of loud speakers) could be heard at all and had any influence or made any impression upon its affairs.

In the last twenty years when its affairs have been considered carefully by your representatives, joined with those of other states, and when they have had committee action and



consideration, and have had the executive officers before them and have had them advise them of the recommendations and the conditions that have existed, they have arrived at wise conclusions and wise determinations and have built up the greatest medical organization of the world, and I think it would be fatal to the future if the time shall ever come when the American Medical Association or anyone of its constituent associations does not belong to, in fact, as well as in name, and is not controlled by, in fact, as well as in theory, the representatives of the practicing physicians of every state and commonwealth in America. I hope our delegates as representatives of this profession will insist on the preservation of those vital principles at every future meeting of the House of Delegates of the American Medical Association.

PRESIDENT REDDICK: Dr. Barbour desires to make a brief statement and we will hear from him now.

PHILIP F. BARBOUR, Louisville: On the 28th and 29th of October there is going to be held at Lexington a follow-up meeting of the White House Conference, called the Kentucky White House Conference. There will be from 1500 to 2000 people present at this conference, and the various phases of child work, of child health, of the defective, delinquent children, or children who need the aid of the state, or local aid, all these various problems of childhood are going to be discussed by the White House Conference.

Following this conference we are going to plan a definite piece of work, of education, throughout the state. This White House Committee is going to call upon various members of the profession in the state to help us get publicity in their different sections and communities, so that the people in the state will get the benefit of the knowledge that is to be gathered together by the White House Conference.

I would like to put this to you as a request from the White House Conference and from me as officiating agent of our profession, that when we write to you about this you pay some attention to the letter and that you heartily enlist in this work. We will give you some definite data and get you to go before your different luncheon clubs, your Parent-Teacher organizations, or in any way that you can make public the results of the White House Conference work. It will be summed up in a brief form that you can present to your people. It means a great deal for the children of our commonwealth.

PRESIDENT REDDICK: We will be glad to have the report of the Committee on Publicity, by S. C. Frankel, Chairman.

S. C. FRANKEL, Louisville: Mr. President and Members of the House of Delegates: As Chairman of the Publicity Committee I beg

to make the following report:

The Publicity Committee feels as if it has accomplished much in bringing to the attention of the doctors of Kentucky the meeting of the Kentucky State Medical Association.

We were very fortunate in obtaining a page in the rotogravure section of the *COURIER JOURNAL* Sunday, October 2, 1932. Articles appeared in the local papers Wednesday, Thursday, Friday, Saturday and today, with pictures of the guests and officers of the Association.

The local papers have promised to have reporters in constant attendance throughout the meetings.

Respectfully submitted,

Harry S. Frazier  
Sam P. Meyer  
Malcolm Thompson  
John D. Trawick  
W. B. Troutman  
Thomas K. VanZandt  
S. C. Frankel, Chairman.

I also wish to say that we are still functioning and will continue to give publicity for the three days of the meeting.

A. T. McCORMACK: I move that the report be received and filed and the Committee be thanked.

The motion was seconded and unanimously carried.

THE SECRETARY: At the request of Dr. Miller, I will read now the report of the Committee on Problems in Health Education. It is as follows:

The American public has become health conscious and is a fertile field for health education. Advertising today carries the health appeal. It remains to be seen if the public is to accept, for the want of better leadership, that of the purveyors of health foods and patent medicines, or whether the profession will assume its proper place of leadership and lead the people out of the maze of balitosis, pink toothbrush, B. O. and athlete's feet.

One of the problems that confronts us is the necessity of changing our concept in regard to our profession. In the past we have been individualists, dealing with units, engrossed in visualizing effects rather than seeking for causes. We need to think in terms of the whole population. It is not sufficient to treat the case of typhoid fever; we must know from whence, by whom and how it came, and apply preventive measures to the community. While the public as a whole is appreciative of health education, they are not sufficiently informed that the benefits of preventive medicine are in proportion to the funds expended and that health is purchaseable.

It is estimated that \$5.60 is spent annually in the United States for patent medicines for

every dollar expended for public health. In 1931, according to the figures of John W. Kelly, Kentucky spent about 34 cents per capita on public health; this includes every available source, county, state, federal government and outside agencies. This year, due to the curtailment of funds, only 23 cents per capita is available from all sources for the promotion of health and prevention of disease. At the shrine of Liberty we vociferate "millions for defense, not a penny for tribute," and at the shrine of Moloch we offer millions in tribute and a moiety in defense. Verily our point of view must change if we are to be worthy of our inheritance. Science and invention have out run the practical application of the product of their genius. We are twenty-five years behind in the utilization of the knowledge we already have in regard to preventive disease. One of our problems is to adequately practice what we preach. For years we have been preaching to the public, "Health examinations on your birthday," and yet few of us have an adequate conception of what a health examination is or ought to be. This is a reversal of the order of things; we have grown up with disease and disease entities, always thinking in terms of pathology, of the end result rather than the beginnings of disease, and lo, an individual comes, not a patient, with no presenting symptoms, in apparent perfect health, and asks for an examination. An examination for what? To see if his health is apparent or real, to detect the beginning of disease, or faulty habits of living that may conceivably lead to a premature decline in health and possibly disease. Such an examination can be no casual affair; it will tax all the diagnostic acumen and skill of the examiner, and in the final analysis it may be that it is the physician who is being appraised rather than the patient.

To talk of birth control is to play with gun cotton, but who knows what "village Hampden or mute inglorious Milton" was lost in the death of 4,000 children under one year of age in our state last year. Do we place the emphasis in the wrong place and "strain at a gnat and swallow a camel?"

Ten thousand of our people died of preventable diseases last year. This is approximately one-third of all the deaths in the state.

In regard to tuberculosis throughout the nation, a satisfactory decline has been in progress for a number of years. For the first five years life the mortality rate has been cut fifty per cent; from five to fourteen, forty-one per cent; from twenty-five to sixty-five years of age, forty-two per cent; over sixty-five years of age thirty-one per cent; but from twenty to twenty-five, there has been a reduction of only twenty to twenty-five per

cent. From fifteen to nineteen years of age, the mortality rate for girls is seventy-five per cent in excess of that for boys. The rate for the nation for the past year is approximately sixty-seven per 100,000. Twenty to twenty-five years ago it was about three times this rate. We can see very little further progress against this disease in our state unless the State Board can be furnished with sufficient funds to wage a progressive campaign against tuberculosis.

The tuberculin test has long been known to us, but the practical application on a large scale has only recently come into universal use. By this means we are able to screen out among school children those who are infected from those who have escaped infection. Since many of our children break down with tuberculosis during adolescence, the first step would be to tuberculin test our children in the high schools, this to be followed by an x-ray examination of all reactors. This can only be brought about by providing traveling diagnostic clinics and trucks equipped with the necessary x-ray apparatus to x-ray the positive cases.

It is recognized today that the only method of detecting early tuberculosis is by means of the roentgenogram. Such a demonstration in a few selected centers would be illuminating and would stimulate public opinion to the point where funds would be willingly granted for a wider use of these methods. Wherever these methods have been applied, two per cent of the children have been found to be suffering with latent or active tuberculosis that needs a curtailment of their activities or active treatment. The finding of such positive cases indicates ordinarily that there is an open focus of infection in the home and necessitates an examination of all contacts. It is conceivable that in certain of our rural centers where x-ray equipment is available, a group of progressive physicians could institute such a survey at a nominal cost to the community. This would result in finding early cases of tuberculosis that would of necessity be placed under the care of the family physician for treatment and observation, and would be a source of revenue to him rather than depleting his already meager income. This service should also be extended to the teachers in the school system, because there are unquestionably open cases of tuberculosis amongst the teachers who are seeding the children under their care.

Where such an examination was conducted in Louisville, 240, or 11.5 per cent, of the teachers showed evidence of pulmonary tuberculosis. Of these, 103, or 4.9 per cent, were considered as showing evidence of a past pulmonary tuberculosis; 137, or 5.5 per cent, were considered as having either active or



latent pulmonary tuberculosis which were potential sources of infection in the schools.

No child should be permitted to indulge in strenuous, competitive athletics without first receiving a careful physical examination. This is beginning to find application in our state colleges and some of the high schools. It should become a universal practice. Approximately two per cent of children in the school system have cardiac lesions. Obviously this can only be detected by physical examination.

In preventive medicine the time is passing where physical inspection of school children can be considered as an adequate part of our program. In health education we have come to the point where the accumulation of knowledge demands a physical examination of every child, and where physical defects are detected the child is automatically referred back to the family physician for treatment. The White House Conference has focused the attention on the wealth of the nation which is the child of today who is the citizen of tomorrow.

Prenatal care is having a definite influence on the future health of the children in Kentucky by detecting defects, errors in diet and habits which when corrected will preclude the possibility of future disease. These are some of the problems that face health education in the prevention of disease today. The specter of state medicine still hangs over the profession, but the intelligent leadership that resides in this body, if put into operation will be fruitful of results and will postpone indefinitely the era of state medicine.

Oscar O. Miller

S. C. Smith

C. V. Johnson

I move this report be received and approved.

The motion was seconded and carried.

SECRETARY McCORMACK: I have the report of the Committee on the Report of the Council.

Mr. President and Members of the House of Delegates: The report read by Dr. Vance at the afternoon session has been carefully analyzed. We are so in accord with the views expressed on the individual items that we shall not consider them separately, but shall recommend the adoption of the entire report as presented.

Respectfully submitted,

A. W. Nickell

Guy C. Forsee

J. Duffy Hancock, Chairman.

PRESIDENT REDDICK: If there is no objection this report will be received and adopted. The adoption of that report carries with it the approval of the appropriations recommended by the Council.

PRESIDENT REDDICK: Report of the Committee on Medical Education.

J. W. SCOTT, Lexington: Your Committee finds the situation as regards medical education much as it was last year.

The necessity for recruiting physicians for practice in the country districts should be constantly in the thought of this body. Any plan to accomplish this which involves lowering of the present standard of medical education is bound to prove a will-o'-the-wisp and lead people and profession alike into disaster. The law of supply and demand will govern. Conditions of living, of practice and of transportation will continue to determine the choice of a location by young physicians. Missionary zeal at the expense of the welfare of one's family and one's own professional development does not prevail among a considerable number of members of any of the professions. The public also should be made to realize its own responsibility in the situation. The clientele which slips away to the doctor in the larger town as soon as winter breaks cannot complain when the local practitioner leaves it.

Establishing hospitals in county seats, equipping these with clinical and perhaps x-ray laboratories in charge of competent technicians would serve to increase the efficiency of the practitioner by relieving him of time-consuming work which can be better done by the non-medical worker. The course in medical technology offered by at least one of our universities which leads through four years' work to the degree of Bachelor of Science will not be useful for this purpose. An intelligent high school graduate, after one year's apprenticeship in a good clinical laboratory can fill such a position without difficulty. There is danger in too high standardization of the non-medical worker. The guild or trade union idea, if you will, which follows upon this is responsible in a measure for the high cost of medical care today.

We wish to call attention to the all too frequent crowding of the pre-medical curriculum with scientific courses beyond the standard requirements of admission to approved medical colleges. These requirements are simple and include only a limited amount of chemistry, physics and biology. The selection of subjects in the pre-medical courses of some of our universities shows poor conception of the sort of cultural education a medical student should have.

Finally, this report would not be complete without reference to the splendid way in which our own medical school here in Louisville is playing its part in medical education. This Association should make every effort to strengthen and to extend its influence already so useful and so widespread.

E. R. PALMER, Louisville: I move it be approved.

The motion was seconded and carried.

A. T. McCORMACK: I note the appearance in the room at this moment of Dr. Joseph E. Wells of Cynthiana, former President of this Association, and I suggest that the two gentlemen nearest him escort him to the front so he may take a seat by the President where we can all make love to him during the rest of the evening. (Applause).

JOSEPH E. WELLS, Cynthiana: I am glad the Secretary had the forethought to have me escorted up here. I could hardly get here by myself. I am very glad to be here with you.

PRESIDENT REDDICK: We are glad to have Dr. Wells here. A great many years ago I sat under his presidency at Lexington.

We will next have the report of the Committee on Periodic Health Examination, by A. M. Leigh, Chairman.

#### REPORT OF COMMITTEE ON PERIODIC HEALTH EXAMINATION

In 1861, Dr. Dobell, an English physician, strongly advocated "A system of periodical examination to which all persons should submit themselves and to which they should submit their children." This excellent advice, as is so often the case, fell upon deaf ears, for most of us physicians, as well as laymen, sigh for the glories of this world rather than the paradise to come, and "make the most of what we yet may spend before we too into the dust descend."

Sixty-one year later the House of Delegates of the American Medical Association adopted a resolution authorizing the Council to prepare suitable forms for the "Periodic Examination of Apparently Healthy Persons." This form was approved at the 1923 meeting and the following year a manual of suggestions for the conduct of periodic examinations of apparently healthy persons was prepared and ready for distribution in 1925.

At the 1925 meeting of the Kentucky State Medical Association the subject of the President's annual address was "The Periodical Examination of the Apparently Well." For the past seven years this Association has stressed the importance of these examinations, and several district societies have devoted a meeting to a demonstration of how a health examination should be made. Unfortunately the Jefferson County Medical Society has not had a demonstration of that kind in the last seven years.

In order to stimulate interest in this important phase of preventive medicine, your Committee suggests the following:

1. Each county society be urged to devote at least one meeting a year to a discussion of this subject, with a demonstration of how to conduct such an examination, especially how to summarize the findings and to give advice

to the healthy client in such a way that he will understand it and follow it.

2. That physicians themselves and members of their families be asked to volunteer as subjects for periodic health examination.

3. That every physician be encouraged to educate his patients as to the value and need of the periodic health examination; this will make the periodic health examination the rule and not the exception. To those of us who treat women and children this task is easy, as they already appreciate the immense value of prenatal care and infant welfare.

4. That the value of the health examination be emphasized in radio broadcasts sponsored by reputable medical units.

5. That the existing health organizations and social service, especially those connected with tuberculosis, teach the value and need of the health examination.

6. And last, that the physician, the general practitioner, if you please, prepare himself for this important work. If such a plan should become universal, it would be the best postgraduate course in physical diagnosis our profession could possibly take. This new viewpoint will elevate the practice of medicine to the position where it really belongs; it will make professional ideals compatible with professional welfare, "a consummation devoutly to be wished."

A. M. Leigh.

A. T. McCORMACK: In moving that this very important report be adopted, I want to make this suggestion. I hate very much to occupy the floor again; there are two or three points, however, about this matter that I believe should go into the records of the Association whenever we are considering the matter of periodic examinations.

It is awfully hard for a man who has arrived at my age or yours to change the habits and methods in which he was trained and in which he has been practicing his profession, and yet if we are going to accomplish the purpose we have in mind, we must, and I wish we could, all keep in our vision all the time the unity of medicine; we so frequently are permitting ourselves to be deflected, to think of surgery and of medicine and of public health and of public medicine as separate entities, while they are all part of the same living profession.

Take the question that is so frequently raised as to the immunization of school children. It is important to remember that immunization came along just at the time that local health departments were beginning to be organized. Nobody was then immunized. We have had a compulsory vaccination law in Kentucky for 125 years, but most of us never vaccinated anybody unless they came to us during an epidemic. We were waiting for



them to come. Now the time has come when this law can be enforced because of an educated public opinion, but it is the duty of the profession to vaccinate every child when it is a year old. The people are not going to bring the children to you when they are a year old unless you tell the people for whom you practice to bring this child when it is a year old and you will vaccinate it for smallpox as the law requires. If that were done there would be no vaccination done in schools, but until we have reversed our attitude and not merely waited for the child to be brought in, but have taught them to bring the child, and have realized our responsibility and have performed our function as the family physician for that family, we are not going to get rid of that nuisance. When the child is nine months old its inoculation for diphtheria should be done by the family physician, because it is his responsibility to carry that protective inoculation through; he is responsible for presiding at the birth of that particular child. That is the duty of the profession to carry that function and that opportunity to their public. When that is done there will be no necessity for mass vaccination and mass inoculation. But when the state forces children to come to school in groups, thereby increasing the danger to those not immunized, it becomes necessary for the state at the same time to provide for the protection of those children from unnecessary illness. If they have already been protected by their family physician at the time when they need it most, so much the better. We know in Kentucky that two-thirds of the deaths from diphtheria occur before the child comes to school; we know from investigations made by the health departments in the United States that when 40 per cent of the school children are inoculated against diphtheria it is impossible to have an epidemic of diphtheria. It doesn't save those children that have died before they start to school, obviously; it merely saves those who have not been immunized by previous attacks of diphtheria.

In the same way, in this important report that Dr. Leigh is bringing to us, here is the opportunity that the qualified physician has. I was glad to hear Dr. Scott's report just previously in which he put the emphasis where it belongs on the excellence of the Medical Department of the University of Louisville, and yet in that splendid Medical Department of the University of Louisville, its own students are not examined to see whether they are physically fit to study medicine. They ought to be. It is as important for them to be physically healthy as it is for them to be able to pass a pre-college examination; I mean physically well enough to live through

the school years and through the productive years of their lives. A man with an obvious heart condition or an active tuberculosis ought not to be studying medicine or studying anything else at that particular time; he ought to be cared for at that time, and when relieved he ought to be permitted to study medicine. At least he ought to know, when he starts in the medical school, his condition so that he can care for it to the best advantage, as anybody else ought to do.

That is the reason for periodic examinations. Until the profession has taught people to come to them for such examinations, and then make the examinations so carefully and give advice of such value that it will really reduce disease and prolong life, we are not going to get the thing over.

It is important in meetings like this, just as it is in prayer meeting where the preacher is constantly belaboring the beloved who are present, who are all faithful or they wouldn't be there, for the sins of those who are not there, that the leaders of the profession realize the conditions themselves and carry back to their local medical societies these important changes in method and in procedure. That is the only way we are going to obviate the danger of communal medicine, which has been the affliction and the burden of every other country, almost, in the world except the United States. We want to continue to give our people individual service; we want to emphasize in every way we can, both as individuals and as an organization, that we are going to continue that thing; we want to protect it with all the might that is in us and all the power and reason that we possess, and the only way we are going to do it is to so arm ourselves that we can give better service to our people than is given by the communized and socialized service of other countries as compared by our death rate and sick rate and their.

JOHN W. SCOTT, Lexington: I want to discuss Dr. Leigh's splendid report. I was very much interested in his discussion of the indifference of the medical man to periodic health examinations as I gathered from what he said. I feel that this is not a reflection on the intelligence or the integrity of purpose or the tenacity of purpose of the medical profession, but is an indication that they really at heart do not believe in periodic health examinations. I submit to this House that the men here who are the leaders, at least the delegated leaders from their county societies, are not practicing it in their own families. I doubt if there is a single man here who is advising his sister and his cousins and his aunts to have periodic health examinations. Perhaps one gentleman holds his hand up that he does.

A. T. McCORMACK: There are two. I am one. I do it myself, too.

J. W. SCOTT: I believe that the thing has been overplayed. I realize that this is heresy and I am prepared to be shot at sunrise, but I must get it out of my system. I feel that the thing has been overplayed. In the first place, a health examination to be competent and to give the subject the assurance that he should have that he is without serious trouble, latent or manifest, requires a length of time and attention to detail and a consequent expense that is beyond the means of 99 per cent of the clientele; otherwise he has a fancied security which is only fancied.

I believe that if we take a census of the representative physicians in this community, this state or any other state, we will find that the smallest number of them put those ideas into practice in their own families. I examine the patients that come to me for a periodic health examination, charge them a fee, and very often tell them just what I am telling you, but I do not advise my relatives who look to me for advice to have periodic health examinations. I tell them that if they will look their bodies in the face, if their bodies don't give them warning by some kind of disorder of function, the chance of their having any serious disease is so small that they need not worry about it. I don't think there are many things that need debunking quite to the extent that the periodic health examination does. As I say, I probably will not look upon tomorrow evening's sun. I expect to have a firing squad take me out at sunrise.

A. T. McCORMACK: I am going to continue my remarks, if you will permit me, as a postscript, because my colleague and classmate, Dr. Scott, always gives you good food for thought. I don't think he ever means to be quite as bad as he talks like he is, but he does pretty well at it.

I want to call your attention to two or three things. Before this Society on three different occasions there has been a demonstration of periodic examinations, and the President of the Association has been examined. One of the Presidents had a condition that would unquestionably have resulted in his total disability within a very short time; that was discovered at that examination.

Another had a surgical condition for which he was relieved immediately that was defined by one of the best surgeons in the county as a developing cancer, a tumor of the mouth that had been there for a long time. It was negligible, but it was found at that examination, and the emphasis made at that examination was the cause of that relief. That won't always happen. You won't find 66 per cent of the difficulties at the examination because all of them are not going to be made that

way, but to any thoughtful member of the profession (and I want to say that I believe there is no more thoughtful member of the profession than my friend Dr. Scott, anywhere) who will take the records of the Metropolitan Life Insurance Company over the period of the last fourteen years, there is a lesson. They pay for the periodic examination of their policyholders each year; they pay \$5 on it to any doctor the policy holder wants. I appreciate fully the superficiality of many of those examinations, I appreciate the inadequacy of many of those examinations, but here is the point; they are paying out cold cash, they are trustees of people's money, and they have to keep books to show that that money is expended as of value to the Metropolitan Life Insurance Company and its policyholders, and they believe they have demonstrated (Dr. Dublin's figures seem to have demonstrated) that they are increasing the longevity of their policyholders who take the examination as compared with their policyholders who don't take it, by something like 8 1/3 years.

Of course, I realize fully that the character of man who will go and have himself annually examined, as a rule is more careful in his health habits anyway, or he wouldn't do it; he is more thoughtful about his condition; he probably would have lived some longer anyway, but it is hardly conceivable that when they run into the hundreds of thousands, as they do with that great organization that insures half the people of the United States, that the enormous mass of figures that they present can fail to have some definite meaning.

I know in my own instance for the past ten years since this thing was first brought to my attention, I would feel just like Dr. Scott does if I hadn't had any examinations made; I would feel like many another doctor does if I didn't know how to make examinations—I know he does; I would feel doubtful about the value of the thing, just as I did about the x-ray when I first saw it. I didn't believe it for the first five years after I owned one, because it seemed unthinkable that it could be doing what it was doing. In my own instance I know as the result of my annual physical examination, in so far as I have carried out their advice (I have taken about 33 1/3 per cent of it, Mrs. McCormack has taken another 33 1/3 per cent more for me, and tried to enforce it, and both of us have missed about 33 1/3 per cent), I am in better physical condition and am more useful because I have taken the advice of careful groups of men who have carefully examined me, from Dr. Dowden here, to the Ford Hospital and the Mayo Clinic and the Life Extension Institute and the other groups of men



who carefully considered my condition and have given me advice about it. That advice as far as I am concerned, has been of value, and I believe that if any man, woman or child will have such examination they will find it of value. I believe every child that is born ought to be brought to the family physician once every month and that the family physician ought to take its clothes off and examine it, ought to look at its teeth and tell whether it ought to go to the dentist or not; I believe it ought to be examined every single month, and I believe the parents of that child ought to pay for that examination every single month. I believe it would be the greatest saving of money to the parents of this country that they could possibly make. I believe if the people of Kentucky would carry their children to their doctors once every month from the day they are born until they are two years old, and then at least once every six months until they start to school, and then annually from that time on as long as they live, more money would be saved in the pockets of the people of Kentucky than it costs to conduct every form of government that we have in the state, that more money would be saved than all our taxes.

I know there are enormous numbers of our people who cannot pay for such examinations. There is an enormous number of them that won't ever have such examinations. But the people who do have them will save more money in expense and the profession will be better supported and better qualified and better deserving of support than it can be by any other means that I know of.

A. M. LEIGH, Louisville: I should like to cite two instances from my own experience (not from my own family) that are two extremes in regard to this periodic health examination. You can't make a good doctor out of a careless doctor, and that health examination is not worth anything at all done by a careless doctor. On the other extreme is the ultrascientific doctor who is going to spend a week examining a person. The man is not able to pay for that examination, and if he were able to pay for it, in the vast majority of cases he wouldn't have it done unless there was something he really thought was the matter with him.

There is a happy medium between these two extremes, and without any disrespect to Dr. Scott at all (I have the highest regard for him personally and professionally), yet there are some country doctors especially that I have known in my career that could tell more by putting their finger on the pulse and looking at the tongue than a lot of us could tell by an exhaustive examination.

A woman came to me one time who was very ignorant; she had lived in the country

all her life: I went over her and found she had a nephritis, a blood pressure of 240, and I didn't give her a bit of medicine, but advised her in regard to her food habits. Inside of six months her blood pressure was down from 240 or 240 to 150. So far as I know she is living now.

I had a patient who was a doctor's wife and a doctor's mother. Her husband was a practitioner and her son was one the best doctors in the State of Mississippi. I was examining her for life insurance, and in the course of the examination (she was around forty-five years old) I found that her blood pressure was low. I knew that all of her people had had tuberculosis as far back as anybody in that community knew, and I just supposed that it was an old tubercular infection that caused her low blood pressure and never thought anything about it until I got back to my office and found her urine was full of sugar. That was during the pre-insulin days, but I immediately went down to see her husband and also called up her son, who lived in another town, and told them the condition. Her son immediately came out, and we put her on a diet—that was all we could do at that time—and this woman lived for twenty years and died from a pneumonia that had nothing at all to do with her diabetes. I feel quite certain she would have died within a few years if she had not accidentally had this examination. I think those were two instances in which an examination, not necessarily a periodic health examination, was of benefit.

JOHN W. SCOTT: I notice these patients came to him and consulted him. I would like to ask him if he has his sisters and his cousins and his aunts come for periodic health examinations.

A. M. LEIGH: The members of my family do, and I advise it, and I advise all my mothers to bring their babies to me at least once a month and I tell them: "I will save you money in the long run."

JOHN W. SCOTT: Do you have your cousins and your aunts and the people in your own family do that?

A. M. LEIGH: Yes, I do. I have even had a Wassermann made on everybody in my family.

SMITHFIELD KEFFER, Grayson: Dr. Scott, you know I appreciate you as much as anyone, but haven't you done life insurance examinations and found a man who had a defective vision, sometimes as low as 20/70, who didn't know he had anything the matter with his eye because he had a good eye on the other side? Likewise an ear? I examined a man the other day who couldn't hear a watch tick within an inch of his ear; yet he thought the other ear was the bad one.

He had poor hearing in the other ear, but was absolutely deaf in one and didn't know it. I think he would have gone to a doctor long ago if he had known how bad that ear was. He is past all human help now.

I think if we can't make them take an annual examination, they ought to take one every two years anyway. I think a good examination is necessary every six months. Our old friend in Lexington told me in 1920 that I wouldn't live three months. I told him I thought he was mistaken, and I have proved it, I think. He thought I was going to pass right out and advised me to make my will right away. I had already made it. I believe my good friends in the medical profession have kept me alive for the past ten or twelve years, just by telling me what not to do. I have tried to follow them pretty religiously and I think that is the reason I am here.

PRESIDENT REDDICK: Dr. Howard will make his report for the Committee on County Hospitals.

C. C. HOWARD, Glasgow: I haven't much of a report to make. The county hospitals are in such bad condition that a fellow doesn't like to report them.

There are two things taking place in the county hospitals, and I guess this is universal in other hospitals. One thing is that it is too expensive to operate them; and another thing is that they don't have enough patients to operate them well.

Down our way we thought we had a law that was helping us take care of our hospital very well, but the court took another view of it and we tried it out and sent it to the Court of Appeals and it was decided against us and we have no law. This law applied to about two-thirds of the State of Kentucky, but the law was unconstitutional, so we don't get any support from the county. I have investigated a few hospitals, and they are all having a hard time, county and city too.

There are two big things that I believe would help. The operating of a hospital is too expensive. There is too much organization and not enough work. There are too many people that are sitting around and not working, but drawing the biggest end of the salaries. I am thoroughly convinced of that I have investigated it and I have even been helping to keep one up, and I have decided to quit that.

Another thing is that the cost to the patients in the hospitals is not reduced any. It is as expensive to go to a hospital as it ever was, even in 1928 and 1926. There should be some way that the people could be served cheaper in a hospital or they will have to stay at home.

There is still another thing that works badly in our community. I don't do any-

thing but surgery, and by the time I can get my patient out of the hospital and he pays most of his bill there, he can't pay me anything.

We are working on this project now; we are trying to sell what you might call five-year insurance. A family pays, say, one dollar a month for five years, and if they go to the hospital in that period of time that will be applied on their bill. If not, we use it for the general fund of the hospital. I don't know how that is going over. We are just beginning to try it.

As I said this morning, Hopkinsville seems to have operated its hospital without outside help and without even county or city assistance better than any small institution I know of, and they have a very nice institution that serves the people well. After all, the final analysis of a hospital is how many people you get well and how quickly you can get them well. I don't care how elaborate a hospital you may have, it is the care of the patient that is important; he wants to get well as soon as possible.

A. T. McCORMACK: The standard is how many autopsies are done.

C. C. HOWARD: Those don't get well. They are going through a very hard period, and we are trying to adjust the situation by beginning at the top. We have had too many high pressure people living in the hospitals, drawing salaries, and we are going to try to cut that down. Then we are going to try to make it so the people can come to the hospital. I am thoroughly convinced that we have too much organization.

We haven't a training school at home because there are so many nurses that need employment now that we can employ the best kind of nurse for \$70 a month and maintenance. As I said before, at Hopkinsville they have a training school, and they have gotten along very nicely with it, but every now and then whoever is higher up threatens them about discontinuing it; they do that nearly every year. That is the thing that I said this morning has gone beyond tolerance, for the reason that they only graduate three or four nurses and use them in their own community. Any man who can take care of himself and his family now is a good one, and any community that can take care of itself needs to be commended. They take care of themselves well and I don't think they lose any more people than we do.

If you will look into it a little more thoroughly, you will find that a bigger institution has almost as many autopsies as a smaller one, and they are not getting any more people well in proportion. At least 85 per cent of the people have to be treated out in the home. We don't all advocate that, but it is true,



nevertheless, and we have to meet it. Obstetrical cases would come into the hospital if it was fixed so they could come in at a minimum fee and the doctor would receive anything. A doctor from home just told me he had nineteen obstetrics in the last thirty days and he didn't bring a one to the hospital for the reason that none of them could pay him anything if they went to the hospital, and he has to live. That is another problem—how to operate the hospitals so people can afford to come.

Of course, not all cases should come to the hospital, but a great many of them would be better off if they came to the hospital.

We are going through a period now of trying to find some way to finance the hospital, and we are going to cut down the expense and then try to meet the people part way so they can come.

There is one thing that hospitals lack everywhere. I don't think I ever walked into one that didn't lack a little kindness. A hospital doesn't meet you and treat you like this hotel does. There will come a change some day in hospitals. They will not be so dictatorial and autocratic. You can remember when the railroads did all that, but you can stop the railroad train anywhere now and get on. The time will come when hospitals will be more considerate. I don't mean they will let the family and everybody stay and run all over the hospital, but there is nothing worse than a dictatorial superintendent or two or three nurses in a hospital that don't know how to meet people. That is another thing we are trying to work out of, and we are not out of it yet.

J. W. SCOTT, Lexington: I know that some of the other hospitals in the state are meeting with difficulty, particularly in regard to this idea of cutting out the training schools in the smaller hospitals, and I think this body would be very much interested in hearing from Dr. Wells, who has that on his mind, I think, and Dr. Moore, of Cynthiana.

J. E. WELLS, Cynthiana: We have had an experience like that in Harrison County. We have had a training school in Harrison County since the hospital has been there. The doctors on the staff of the hospital have trained these nurses at their own expense, with no charge at all. Recently we have been notified that we will have to quit training nurses; we were so notified by the State Board of Nurses' Examiners of Kentucky.

We have graduated in twenty years about twenty-five nurses. They have all passed the State Board examination, and some of them of got through by the skin of their teeth. There has been no criticism of the ability of our nurses, but it strikes me that the trouble seems to be more the vacant beds in the city

hospitals. It looks very much to me like a disposition to cut out the small hospitals in the state. We need hospitals in small towns like ours with 5,000 inhabitants just the same as they do in Louisville or Lexington or any other city. We are willing to do this work and have done it. In fact, we have spent time to educate these pupil nurses, and they have gone before the Board and come through with good records. Now we are asked to discontinue our training school.

There isn't any doubt that with a training school you can operate a hospital more cheaply. If we had to hire trained nurses at the prices we used to pay them, we wouldn't be able to do it. We pay our nurses anywhere from \$6 to \$20, depending on the time they have been there, and they have done their work as well as trained nurses under the supervision of a registered day nurse and a night nurse. We have a superintendent and an assistant superintendent. I believe that the smaller hospital will have to have a training school in order to get by. While we have some endowment and expect to get some more pretty soon, but as long as we haven't endowment sufficient to carry on that hospital we have to have a nurses' training school in order to get our nurses at a cheaper rate than we would have to pay for graduate nurses.

I think it is a question confronting small town hospitals, and I think they ought to get together and try to adopt some plan by which we can continue our training schools.

So far as the clinical experience is concerned, they get better clinical experience in Covington, Louisville, Lexington, than they do in Cynthiana, but so far as the didactic lectures are concerned there are no better. I am not throwing bouquets at myself, but the staff of that hospital goes there three nights out of a week for nine months and lectures those pupil nurses and the superintendent and the assistant superintendent lecture them every day. We have turned out as good nurses as we can get anywhere. What we want is a training school, and if we have one we can carry on our hospital.

B. B. KEYS, Murray: Why should you be asked to discontinue?

J. E. WELLS: That is what we don't know. We were notified by the State Board of Nurses' Examiners in a letter. I wrote to them in regard to continuing our hospital. "In our letter to Mrs. McMurkin we did not intend to convey the idea that we wished your hospital to close at once. We do not desire that you take in any additional students, but allow those you now have in the training school to complete their course. The Board studied this situation from all angles before taking this step, and we trust you will see the

matter from our viewpoint." That is from the Secretary of the State Board of Nurses' Examiners.

Our staff had a meeting and asked them to state specifically what their objections were, what their indictment against our training school was, and we haven't had that yet and I don't think we ever will get it.

E. R. PALMER, Louisville: How does anybody get the authority to dictate to doctors as to what they shall do as regards training their help? I don't know what this State Board of Nurses is.

THE SECRETARY: The same thing as the State Board of Registration in medicine.

E. R. PALMER: Have they the power to override the medical profession?

THE SECRETARY: They have the power to recognize or not to recognize nurses training schools.

E. R. PALMER: It doesn't look to me to be right. It seems to me the doctors themselves should have the say-so. I agree with Dr. Wells; I think a hospital such as they have and a staff such as they have is just as capable of training nurses as any other hospital, and I don't believe that any board outside of a medical board should have the right to tell them that they shall stop training nurses.

P. D. GILLIM, Owensboro: I think this Association should take action on this subject. I don't know that we can do anything more than bring pressure to make the nurses' association see their subserviency.

In our town we have a hospital of over 100 beds. We have an excellent training school. We have to send some of our student nurses to Louisville to the Crippled Children's Hospital because they do not think we have a sufficiently large department of pediatrics. We are on the point of rebelling against any such high-handed methods, and I am glad to see that the members here are preparing to become active in this matter. I think the physicians themselves should dominate this question wholly.

J. E. WELLS: We have always complied with the rules and regulations of the State Board of Nurses' Examiners. We too assigned our nurses for nine months out the year (we formerly did for six months) to a larger hospital to give them the clinical experience. We have always complied with their requirements along that line, because we have only a thirty-bed hospital. We have sent our nurses to larger hospitals, Covington for a while, Louisville for a while, and now we are sending them to Lexington.

C. C. HOWARD, Glasgow: I want to ask who composes this board, whether it is appointive, who they are, and how to arrive at this.

THE SECRETARY: The State Board of Nurses' Examiners is composed of seven registered nurses appointed by the Governor. The state association of nurses gives twelve names to the Governor, and from them he selects the seven members of the Board, as I recall.

C. C. HOWARD: They brought up the question that we graduated so many more out in the country than in the city. I looked into that. This was a man from the American College, just a young fellow, too who never had practiced very much. I didn't take much stock in what he said. I would rather a man who had had a little experience would talk to me about those things. He said that he thought the majority were out in the small hospitals. I said, "It doesn't sound reasonable. All the hospitals around here graduate only about three. Bowling Green graduates two or three, and that's the average. They are assimilated in that community. They are trained for that doctor; he trains them."

Dr. Scott and Dr. Palmer I know would much prefer some girl that they had helped train, and she would take more interest in them; moreover, she knows the people in that community. You would rather have her than someone we would send you, and we would rather have one of our own. That is natural. Each community assimilates its own girls, and some of them, a great many of them, marry and quit the profession.

He said that the smaller hospitals were graduating more than the larger ones. I looked into that. We graduated in the state last year, sixteen. I almost never got that information from the Board, either. I wrote and wrote for that. Finally I got it, no courtesy much in the answer, either.

As Dr. Wells said, they all affiliated with some other hospital. There is some good in being affiliated, and some bad. A lot of them come back not as good as they were when they went away. I have watched all that. I have been on this committee for quite a time studying this thing, and I feel the time is ripe for the doctors to take a little hand in this some way. I think in some way we ought to be able to get something done about this. I don't know just how, but I want to make a motion to that effect.

In the absence of Dr. Reddick, the President, the Secretary took the chair.

CHAIRMAN McCORMACK: If it meets with the approval of the House, this is a very important matter and the Chair would like to have the privilege of appointing a committee to consider this matter and formulate a statement setting forth the attitude of the medical profession of Kentucky on this subject, to be reported at the Thursday meeting of the House of Delegates.



JOHN W. SCOTT: I think the thing is quite far-reaching. This principle that is coming to the surface here is just a part of this idea of the sophistication of the non-medical worker. Two years in heaven's name is enough to train a nurse to take care of sick people. The nurses get together and decide two years is not long enough because there are too many nurses getting in, so they raise it to three years. Now the cry is: "Don't let's lower the standard." Just what we are doing, of course. I don't think it is our job to maintain their idea of increasing sophistication of the non-medical worker. We are getting the same thing with the technicians. We are giving a college course in Lexington for technicians, through four years of training with a degree of Bachelor of Science for somebody to act as a technician to count blood and to do blood chemistries and such things that any intelligent high school girl can learn to do in a year with ease, in less than a year.

These nurses have their organization which is well controlled, well managed, and has large political influence, and they are putting the screws on the rest of us.

I feel it would be a crime to the health of this state for an institution such as the Harrison County Hospital to have to go out of existence, and a hospital down in Dr. Howard's section like the Hopkinsville Hospital. Those hospitals are the very salvation of the situation. These city hospitals can take care of themselves, but this is a blow to the very life of such hospitals as that.

C. C. HOWARD: The matter, of course, is always in our own hands. Whenever the medical profession determines to use practical nurses instead of registered nurses we have the remedy immediately.

J. W. SCOTT: You can't use them in a hospital.

C. C. HOWARD: This is one of the most important subjects that has come before the profession in a long time. It has been coming to a head for a long time. We probably have delayed too long to take action. In order to have any effect, our thoughts in the matter should be carefully stated, taking into consideration the status quo with the desirable modifications of the system that are essential to the future continuation of the hospitals of the state. The question should be put fairly before the public as to whether they desire the hospitals of the state to be compelled to increase their cost probably by forty per cent, or whether they desire to have them conducted as efficiently with the increasing efficiency that they have been conducted with for the past twenty-five years. It seems to me that is a matter of sufficient importance that our views should be placed

before the people of the state in words and terms that will carry the conviction that is within us.

CHAIRMAN McCORMACK: I don't want to stop the discussion, but the committee will be informed as to the question at issue by the discussion, and if somebody will make a motion that the Chair appoint such a committee, I will appoint a committee to report on Thursday to the House of Delegates, a statement of our views in the matter.

B. B. KEYS, Murray: I operate a hospital too, and have been doing so for twelve or fifteen years. I have a twenty-two bed hospital, a good one, too. Dr. Scott and Dr. Howard talk about the expense of a hospital and about the nurses. Ours is a private hospital; my partner and I own it. We have no endowment, we have nothing but what comes in from our own work; we have to work all the time and we work hard. We have five nurses. We have one nurse who came from Lexington as our superintendent. All the balance of them we trained. One of them is a technician. We don't pay those nurses high salaries and we are getting by all right. We have to work from daylight until dark and then from dark until daylight, but we are getting by.

We pay our nurses more than they could get any other way. We pay some of them \$25 a month and their maintenance, some of them \$10 and \$12 a month and their maintenance. There aren't any other girls down there getting any more than that.

Some of you say that isn't enough to pay a nurse. That is enough to pay a nurse if she can't get any more. They are trained as well as nurses that come from larger hospitals.

E. A. PALMER: Does that Board have any control over you?

B. B. KEYS: No. We tell them when they train them, and we tell them we don't give them any credit, but they nurse for us.

E. A. PALMER: You don't turn them out as graduates?

B. B. KEYS: No. We tell them when they come in that they don't get any credit, that they work for us, but we will make nurses out of them.

E. R. PALMER: They are practical nurses.

B. B. KEYS: Yes, but they are as good as anybody's graduate nurses.

W. B. MOORE, Cynthiana: If we can't have graduate nurses we must train our own. The small hospitals, right now at least, cannot operate unless they have training schools. They haven't the money to hire nurses and pay them \$75 or \$100 a month. We can train the nurses and let them go out as practical nurses.

J. E. WELLS: The only objection that the

State Board of Nurses's Examiners has ever made that I have heard is that the profession is crowded. A hospital like ours isn't crowded. We have graduated twenty-five nurses in twenty years, and about half of those have married. That doesn't crowd the profession. If that is their only excuse, I don't see why they don't drop out some of them in the larger hospitals.

Dr. Moore is right about it. If we are compelled to go into the employment of practical nurses we are going to defeat the very principle that they are striving for in raising and elevating the standard, because we will have to employ practical nurses to do the work that these girls we are training are doing, who will go out and say, "I have been at the hospital so long, I am a nurse." It will defeat the very thing they are trying to foster.

I agree it is all right to have a high standard for nurses. We don't train them at our school unless they are sufficiently prepared, at least in our estimation, and the Nurses' Board has always passed them. If we are going to have to employ practical nurses, after a while we will have a flock of practical nurses competing with the registered nurses.

SMITHFIELD KEFFER: We all know that there is not a school district in the State of Kentucky where there are not two or three practical nurses. They picked it up as they went along. In every school district there are two or three women I like to have on my obstetrical cases, and if they were not there I would try to get them there because they are valuable assistants. There is no reason why a bright, intelligent girl of sixteen or over, who has the equivalent of an eighth grade education, can't become a good practical nurse in a reasonable time and be a useful adjunct to your hospital.

We have a little hospital at home; we have a very good surgeon there, and he has been doing his level best to give us good hospital service and has succeeded. He has only one registered nurse, and he has a practical nurse there who had about one year in the Huntington Hospital, took a notion to get married, and then came back. She has worked there three or four years, and she is a good, up-to-date nurse. I believe if I were sick myself I would as soon have her as a registered nurse. I believe what you gentlemen advocate is possible and they are going to have to come to it.

B. B. KEYS: I make a motion that the Chair appoint a committee to look into this thing further.

The motion was seconded by Dr. Keffer and carried unanimously.

CHAIRMAN McCORMACK: I will appoint as

Chairman Dr. Gillim, and Drs. Scott, Palmer, Howard and Keys, who represent every different activity as far as the training of nurses is concerned, on the side of the institutions; they are men of experience and who have within them words of wisdom that I am sure will be appealing to the thought of the people of Kentucky. I hope they will have their report ready for action Thursday.

C. C. HOWARD: The secretary of the nurses board lives here, does she not, and has her office here?

J. E. WELLS: They are all here but one.

C. C. HOWARD: I want to suggest that this committee make an appointment and meet them. They are the ones I want to talk to. If I want to buy a horse I want to talk to the fellow who is going to sell the horse.

Upon motion regularly made, seconded and carried, the meeting adjourned at 6:30 p. m.

#### THURSDAY MORNING SESSION

OCTOBER 6, 1932

The second and final session of the House of Delegates convened at 8:00 a. m., Thursday, October 6, Philip F. Barbour, Louisville, presiding.

PRESIDENT BARBOUR: The first order of business is the roll call.

PRESIDENT BARBOUR: There is a quorum present.

Before we go into the official election of officers, I would like to say in behalf of the Program Committee, and I wish you would take it back to your respective counties, that the Program Committee appreciates the way in which the different men in the different counties have responded to our invitation to prepare papers.

I also personally want to express my appreciation to you for your courtesy on the floor at all times.

The election of officers is the next order of procedure. First is nominations for President.

E. R. PALMER, Louisville: I wish to place in nomination for the President of our wonderful organization, a man who has been most faithful in the work for the Kentucky State Medical Association of any man that I know of. He is a man whom we all love and respect, and I know of nothing that we could do that would honor the Society more than to bestow this honor upon him.

I therefore nominate W. M. Martin, Harlan, for President of the Kentucky State Medical Association. (Applause).

PRESIDENT BARBOUR: Are there any further nominations for the office of President?

H. H. HUNT, Mayfield: I make a motion that the nominations be closed and that the Secretary cast the unanimous ballot for President.



The motion was seconded and unanimously carried.

THE SECRETARY: I have the honor of presenting you, Mr. President, with the ballot of the House of Delegates.

PRESIDENT BARBOUR: I have the pleasure of informing you that Dr. W. M. Martin is unanimously elected as President for the ensuing year.

Next, nominations for Vice Presidents.

THE SECRETARY: Three Vice Presidents are nominated, one from Eastern, one from Western, and one from Louisville. No delegate is eligible.

J. H. PRITCHETT, Louisville: I would like to place in nomination Dr. Charles W. Hibbitt, of Louisville.

The nomination was seconded.

E. M. HOWARD, Harlan: I want to place in nomination a man from Eastern Kentucky, J. E. Johnson, from Stone.

The nomination was seconded.

H. H. HUNT: I want to nominate Dr. J. N. Bailey from Western Kentucky, from Paducah.

P. H. STEWART, Paducah: As an alternate I call for the enforcement of the rule that delegates are not eligible for election to office.

J. N. BAILEY, Paducah: Being the man nominated I ask the Doctor to withdraw my nomination.

H. H. HUNT: I nominate E. B. Walters.

THE SECRETARY: To be elected President or Vice President a man must be present at the meeting.

H. G. REYNOLDS: I arise to nominate Dr. W. T. Little, of Calvert City.

The nomination was seconded.

E. R. PALMER: I move the nominations be closed and the Secretary be instructed to cast a ballot for the three names for Vice Presidents.

The motion was seconded and carried unanimously, and the Secretary cast the ballot.

PRESIDENT BARBOUR: I have pleasure in announcing the election as Vice Presidents of C. W. Hibbitt, Louisville, J. E. Johnson, Stone, and W. T. Little, Calvert City.

Next in order is the election of a delegate to the American Medical Association to succeed Dr. Irvin Abell, Louisville.

W. E. GARDNER, Louisville: I wish to nominate Dr. Irvin Abell, Louisville, to succeed himself. It is a position of great responsibility which Dr. Abell has very efficiently filled.

A. T. McCORMACK: Knowing Dr. Abell's distinguished service to the profession of the State of Kentucky in the House of Delegates of the American Medical Association, and having been associated with him there for a number of years, I should like to have

the privilege of seconding that nomination.

E. B. BRADLEY: I move the nominations be closed and the Secretary be instructed to cast the ballot.

The motion was regularly seconded and unanimously carried.

THE SECRETARY: I have the pleasure of casting the ballot, Mr. President.

PRESIDENT BARBOUR: Dr. Irvin Abell, Louisville, is elected as Delegate of our Association to the American Medical Association.

A. T. McCORMACK: There is a vacancy in the Council by reason of the expiration of the term of Dr. R. C. McChord, of Lebanon. Dr. McChord has been a member of the Council since it was originally organized, and was Chairman for some twenty years. Mr. President, I ordinarily would take no part in the nomination or election of officers, but I know I voice the sentiment of every man in this House and in the Association in desiring to again honor a great man who back in 1885 was a President of this Association and has never missed a session and who is always faithful and zealous in his work for all of us. We all love him. I would like to nominate Dr. R. C. McChord, of Lebanon, for Councilor of the Sixth District.

A. W. NICKELL, Louisville: I wish to second the nomination.

E. R. PALMER: I move the nominations be closed and the Secretary cast the ballot of the House.

The motion was seconded and unanimously carried, and the Secretary cast the ballot.

PRESIDENT BARBOUR: Dr. McChord is unanimously elected Councilor for five years.

THE SECRETARY: The term of the Councilor for the Tenth District, Dr. C. A. Vance, has expired.

E. B. BRADLEY: I would like to nominate Dr. Vance to succeed himself as Councilor for the Tenth District, and I also move you that the nominations be closed and the Secretary be instructed to cast the unanimous ballot.

R. M. SANDLIN, Richmond: I second the motion.

The motion was carried unanimously and the Secretary cast the ballot.

PRESIDENT BARBOUR: Dr. C. A. Vance, Lexington, is unanimously elected Councilor of the Tenth District to succeed himself.

THE SECRETARY: There is a vacancy by the election of Dr. Martin as President, in the Councilor for the Eleventh District.

C. A. VANCE: We are sorry, of course, to lose Dr. Martin, but we have another good man up there. I would like to nominate W. K. Buttermore from Harlan County.

E. R. PALMER: I second the nomination.

SMITHFIELD KEFFER: I move the nominations be closed and the Secretary cast the

ballot of the House.

The motion was seconded and carried unanimously.

THE SECRETARY: Mr. President, I take pleasure in casting the ballot.

PRESIDENT BARBOUR: Dr. W. K. Buttermore is elected Councilor for the Eleventh District.

The next nomination is for the position of Orator in Surgery.

V. A. STILLEY, Benton: I wish to place in nomination one of the outstanding surgeons of Western Kentucky, a man who has always been an Association worker, and I feel that he would honor us if elected. I would like to place in nomination Dr. E. W. Jackson from Paducah, for Orator in Surgery.

H. H. HUNT: I wish I had words of praise to excel those of Dr. Stilley with respect to Dr. Jackson. I want to second the nomination.

H. G. REYNOLD: I move that the nominations be closed and the Secretary be instructed to cast the unanimous ballot of the House for Orator in Surgery.

The motion was seconded by J. N. Bailey and carried unanimously.

SECRETARY McCORMACK: Mr. President, it is with peculiar pleasure that I cast this ballot, because it is a very unique experience and honor to be conferred upon a very distinguished member of the profession. Dr. Jackson was at one time the Orator in Medicine and delivered one of the most distinguished orations that was ever delivered before this Association. Having qualified himself as one of the best internists in the commonwealth, he then devoted himself to surgery, and has qualified himself so that he merits, as he shall now receive, the distinction of having been Orator in both Medicine and Surgery. I take great pleasure in helping to confer this rare distinction upon a very, very good man indeed.

PRESIDENT BARBOUR: Dr. Jackson has been elected to the position of Orator in Surgery.

Nominations for Orator in Medicine.

O. O. MILLER: I wish to nominate a gentleman who represents the highest ideals of medicine, Dr. C. C. Turner, of Glasgow.

The nomination was seconded.

A. W. NICKELL: I move you that the nominations be closed and that the unanimous ballot be cast.

The motion was seconded and unanimously carried.

THE SECRETARY: I have the great pleasure in casting the ballot for Dr. Turner. It is the second time I have had that privilege, and I know he will consider it great honor to be elected Orator in Medicine the second time.

PRESIDENT BARBOUR: Dr. C. C. Turner has been unanimously elected Orator in Medicine.

Place of meeting for next year.

THE SECRETARY: It is to be in Western Kentucky.

B. B. KEYS, Murray: We people down in Calloway County, the county seat of which is Murray, would like very much to have this state society meet with us the ensuing year. We have a small city down there of some five or six thousand people. It is very accessible. Highways No. 60 and No. 68, hard surfaced roads from any part of the state, go there, with bridges across both the Cumberland and Tennessee Rivers. Of course we are way in the extreme western part. We are not very far from Paducah, as you know, where the society has met at some other time. The L. & N., the I. C. Railroad, and the N. C. & St. L. run close to us; the N. C. & St. L. goes through our town.

Our society would be mighty glad to entertain this state meeting at Murray.

So far as the entertainment is concerned, we have two hotels in our town, really, but we have one new one that will take care of fifty or sixty people, and then we have the Murray State Teachers College there. All its buildings are new and modern in every way. We have dormitories to take care of 400 or 500 people. We have one of the largest auditoriums in the city.

We don't have as much entertainment as you have in Louisville or in a lot of other cities, of course, but in association with our neighbors in Western Kentucky we can give you as good entertainment as any community of that size.

I have all sorts of telegrams and letters from Dr. Wells, the President of the College, the President of the Rotary Club, the President of the Exchange Club, the Mayor, and the Woman's Club, insisting that this meeting come to Murray.

We have an active Woman's Auxiliary who join us in this invitation and ask us to urge the attendance at Murray of our wives and daughters next year.

We have a county health unit that is operating and, just to show you that we are trying to keep up with the progress of medicine, has been operating several years. We have a full county health unit approved by the State Board of Health that is working and functioning fine. We don't have the disturbances that some of the counties are having. We are working fine, everybody is co-operating.

We have two hospitals in our town, which, of course, is another thing that shows we are trying to do things in the right kind of way. We have two pretty good hospitals.

When the speaker was talking about the milk situation last night, it reminded me that two or three years ago I asked Mrs. Dugan to



come down and give us an inspection of our dairies. The State Board of Health very kindly sent her down, and at the present time we have our dairies and everything working splendidly. I mention this because you never know what you are getting in the way of milk unless it is under the observation of the State Board of Health or some health department. We are standing right up at the top in milk care, pasteurization, and all that.

I talked to Mrs. Dugan last night, and she gave me the information that my county was right up at the top in the state, and possibly the only one that was equal to or exceeded Louisville, with the exception, perhaps, of Henderson.

The water in our city is furnished from three deep levels about three or four hundred feet deep. We have no possibility of any contamination. It is kept tested by our county health department and by the State Board of Health.

I talked to Dr. Wells about the time, and you can meet anywhere from the first of August to the fifteenth of September. We would be very happy indeed to have you folks come down. I have lots of doctor friends all over the state and would like to see them there. Our county never has had this meeting, never asked for it but one time, and I believe that was year before last. Lots of my friends promised me then that they would come this year if we would invite them again. We will try to make things as pleasant as we possibly can.

J. N. BAILEY, Paducah: I shall not attempt to make as flowery a speech as my good friend from Murray, because we have a love feast down in the First District and we are all neighbors. While I was sitting up in the meeting chamber yesterday afternoon with one of my friends and colleagues, he admired the intelligence labeled on the faces in that room, and he said to me, "Bailey, we want the medical profession of Kentucky to know that we honor and respect them and love them and we want them to come to Paducah next year."

Only a few months back we saw the newspapers full of this thing we call instructed delegates. I happen to be one of that kind of animal, and I think I will read to this organization what my county medical society said to me when I started up here. "McCracken County Medical Society extends a very hearty invitation to the Kentucky State Medical Association to meet in Paducah in 1933. Paducah has enjoyed this distinction on several previous occasions. Paducah is in a better position than before to entertain this distinguished society of doctors, especially in the way of hotel facilities, as they are far better than ever before. Therefore we espe-

cially invite you next year." It is the wish of every doctor of McCracken County to have the Kentucky State Medical Association meet in Paducah.

I shall not dwell on our facilities except to say that Paducah has a class of hospitality all its own. It is not only the doctors; it is the organizations and laymen of Paducah. We are not quite as close to Golden Pond as our friend from Murray, but we certainly are a Christianized community among a bunch of good fellows.

I might say to you that we don't get our water from deep wells, but we have some of the best water in the State of Kentucky.

I am not going to take time to read all of these telegrams, but here happens to be one from the Mayor, one from the Secretary of the Lion's Club, one from the Board of Trade.

"We join the Board of Trade in placing our entire organization at your disposal during the 1933 convention in Paducah.

Rolly Brockmans, President,  
Junior Association of Commerce.

Here is one from the president of the Woman's Club, and they are wonderful entertainers down there. "Paducah wants you for 1933." Notice this appealing type. "We will try to make your stay pleasant in every way.

Miss Margaret Wall, President,  
Junior Woman's Club."

Gentlemen, she is a wonderful entertainer, too. Here is one from the Boy Scouts, and last, but by no means least, is an invitation from the Hotel Irvin Cobb. Gentlemen, we want you with us if you will come down there.

PRESIDENT BARBOUR: How is the milk down there?

J. N. BAILEY: I thought these gentlemen were all weaned. It is approved by the State Board of Health, and McCracken County was one of the first to pass the ordinance as required by the United States Public Health Service to standardize the milk supply.

H. H. HUNT: I live just halfway between Murray and Paducah, and it looks like I am in position to settle this discussion. Dr. Bailey's invitation reminds me very much of what I call a half-wit—not that he is one, but his invitation to Paducah makes me think of one. When I was a boy I went to church, and a half-wit was there sitting on the front seat. It didn't make any difference what the preacher said, he would put up his right hand say, "Oh, you're going to hell." Bailey and the people of the surrounding country are as hospitable, they have just have to ask you to Paducah, no matter what happens.

We have been hearing for the last two or three years that everybody was going to

Murray. Gentlemen, you will be surprised when you see Murray. You will find it a most beautiful place and plenty of accommodations to take care of 2000 folks. They will feed you for a dollar a day, and next year you'll need it. You had better come down. The rations down at the Irvin Cobb are from \$1.50 and \$1.75 up, and it will all be up. You had better come to Murray from the economical standpoint.

I've never balked yet. I've been to Owensboro, Bowling Green, Lexington, Louisville, and always have been glad I went. Gentlemen, the bell is hanging on the outside down there at Murray. Come down and see us.

E. M. HOWARD: I want to second the nomination of Murray. Possibly some of you don't know where Murray is. Dr. Keys took pains to tell you.

A motion was regularly made, seconded and carried that the nominations be closed.

PRESIDENT BARBOUR: I will appoint Dr. Gardner and Dr. Bradley to spread the ballot.

Gentlemen, I am informed the result of the ballot is Murray 41, Paducah 16.

J. N. BAILEY: I would like to announce to the Association that this was a neighborhood affair and we are all friends. We are all in the First District and Paducah loves Murray. Everyone of the doctors from McCracken County will be over there with bells on and help to entertain you. (Applause).

I move it be unanimous that we go to Murray.

The motion was seconded and carried unanimously.

PRESIDENT BARBOUR: With respect to the appointment of the permanent committees, an item on the program, the Chair craves the privilege of going over these committees and making their appointments after a little bit of consideration.

Next is reports from committees that have not reported. The first is the Medico-Legal Committee, J. B. Lukins, Chairman.

#### REPORT OF MEDICO-LEGAL COMMITTEE

My report will be very brief, because I took up enough time yesterday in the talk on malpractice suits. This is just my regular annual report.

We have on hand and still pending, four very old cases. Two of these were called for trial, but neither plaintiff nor lawyer showed up, and the cases were continued.

Twenty-four cases have been disposed of since I last reported to you last year in Lexington. Four of these cases were dismissed by the court. Eleven were settled for small amounts, one as low as \$5. In one, a judgment was given for \$1000 and was settled later for \$500. One was dropped by the plaintiff without trial. Three the jury gave the verdict for the defendant; one the judge

threw the case out of court. Three cases the court gave peremptory instructions for the defendant.

We have now, October 1, 1932, eight cases pending. This does not, of course, include the threatened cases. There are any number of threatened cases, some of which we keep no record of. There are any number every month. Some of them I never hear of gain.

No cases this year were taken to the Court of Appeals. One case, however, was tried in the Federal Court. This is a case where the plaintiff did not live in the state. The judge returned a verdict for the doctor. That was Judge Cochrane.

Each case threatened where suit was filed has been closely followed and usually terminated by the plaintiff dropping the claim.

I just want to say that there has been a good deal of question in our minds about the effect that the depression has had on malpractice suits. When the depression began about three or four years ago, it looked like it was going to swamp us. It increased materially in 1930 and in 1931 it was one more than it was in 1930, but this year it is just about half, so people are either getting used to the depression or they have found out that we doctors are so poor there is no use to sue us.

J. B. Lukins, Chairman.

W. E. Gardner, Louisville, took the chair.

O. O. MILLER: I move Dr. Lukins' report be accepted and filed.

The motion was seconded and carried.

CHAIRMAN GARDNER: Next is the report of the Auditing Committee, W. D. Reddick, Lexington, Chairman.

SECRETARY McCORMACK: Dr. Reddick is not here, but the report was left with me.

The Auditing Committee has examined the records and finds them correct.

A. W. Nickell,

R. G. Webb,

W. D. Reddick, Chairman.

CHAIRMAN GARDNER: You have heard the report. Do I hear a motion to adopt it?

E. M. EWERS, Somerset: I move it be adopted.

The motion was seconded and carried.

CHAIRMAN GARDNER: Next is the report of the Committee on Crippled Children, J. D. Trawick, Chairman. (Not present.)

Next is the report of the Heart Committee, E. F. Horine, Chairman.

#### REPORT OF HEART COMMITTEE

E. F. HORINE, Louisville: Your Committee during the past year has continued the study of the prevalence of heart disease in Kentucky. This study has not been entirely completed, though we are now able to present the following statistics concerning the first



1065 cases studied:

Arteriosclerotic heart disease.....	48
Hypertensive heart disease.....	807
Congenital heart disease.....	3
Rheumatic heart disease.....	77
Syphilitic heart disease.....	107
Hyperthyroid heart disease.....	9
Functional heart disease.....	14

Total .....1065

Essential hypertension constitutes by far the most prevalent type of heart disease encountered in Kentucky. The statistics presented above show that it is found in over 75 per cent of heart cases. At present we are making a special study of hypertensive heart disease along racial lines, and trust that we may be able to report something of interest concerning this at a later date.

The Committee continues to offer its services collectively as well as individually to any county society desiring information concerning any phase of the heart problem.

Respectfully submitted,

Austin Bell, Hopkinsville  
J. W. Kincaid, Ashland  
Walter Byrne, Jr., Russellville  
John W. Scott, Lexington  
J. R. Morrison, Louisville  
W. L. Taylor, Owensboro  
Silas Griffin, Henderson  
Emmet F. Horine, Chairman.

A. W. NICKELL: I move the report of the Heart Committee be received and filed.

The motion was seconded and carried.

THE SECRETARY: I am instructed by the Council to report an amendment to the Constitution providing for the membership in the House of Delegates for the five immediate Past Presidents, so that we may have the value of the advice and assistance in our deliberations of these men who have had the two years of ripe experience as President Elect and as President, as follows:

The period at the end of Article V of the Constitution be made a comma and that the following words be added; (3) the five immediate Past Presidents so that Article V as amended shall read as follows:

#### ARTICLE V.—HOUSE OF DELEGATES

The House of Delegates shall be the legislative and business body of the Association and shall consist of (1) delegates elected by the component county societies, and (2) ex-officio, the officers of the Association as defined in Article VIII, Section 1 of this constitution, and (3) the five immediate Past Presidents.

CHAIRMAN GARDNER: AS I understand this amendment as proposed, when it becomes effective the retiring President will be automatically a member of the House of Delegates for five years, his predecessor will be a member for four years, the predecessor of his pre-

decessor for three years, and so forth, so we will have one retiring President each year becoming a member of the House of Delegates with continuously five ex-presidents of this Association always members of the House of Delegates.

The Council discussed this matter the other day, and it is heartily approved. In fact, some such method as this was suggested by Dr. Vance, who is Chairman of the Council. In order that we may have the advice and experience of retiring Presidents, we feel it is a very good thing. This amendment will be considered introduced. It will be published in the JOURNAL.

Committee on Postgraduate Course, Charles W. Hibbitt, Louisville, Chairman.

THE SECRETARY: This is Dr. Hibbitt's report:

#### COMMITTEE ON SUMMER POSTGRADUATE COURSE

The Committee on Summer Postgraduate Course of 1932 beg to submit the following report:

It was decided this year to arrange the clinics for the second and third weeks of June and thus secure the extra program of the scientific addresses by a number of the former graduates of the University of Louisville who had gained prominence in other cities and who were here to attend the commencement of the Medical College.

The first day was given over to the visitors and the balance of the two weeks (60 hours) was taken care of by local members of the profession. The program was so arranged that a visitor wishing work in any special department of medicine would find particular days devoted to surgery, medicine, and specialties.

The registered attendance was twenty. This small attendance was due, we are sure, to causes over which we have no control. Those in attendance expressed themselves as being greatly pleased with the practical course the physicians gave them.

We would recommend the continuance of the course in 1933 if general conditions improve and it is the desire of this Association.

Respectfully submitted,

Charles W. Hibbitt, Chairman  
John R. Wathen  
John W. Moore.

CHAIRMAN GARDNER: Report of the Committee on Military Medicine and Medical Veterans' Affairs, R. L. Woodard, Hopkinsville, Chairman.

THE SECRETARY: The American Medical Association's Committee, under the able leadership of Dr. H. H. Shoulgers, of Tennessee, has been making an effort to secure an adjustment of the very unfortunate situation that exists through the workings of ordinary political methods in Congress by which the

Veterans' hospitals were thrown open to ex-service men with non-service connected disabilities or acute illnesses. This situation is unfortunate in every way. It tends to pauperize the soldier. It is objectionable from every economic standpoint in the world. It means, eventually, that we are going to have to build, almost to duplicate, every civilian hospital in the United States and leave them empty while in the neighborhood of them we are erecting federal hospitals. It is objectionable from every viewpoint that I can imagine.

The Association is particularly anxious that especially those of us who are Veterans and members of the Legion and the various other military organizations, shall exercise our influence with them in order to get them to understand the matter. From the selfish standpoint of the Veterans themselves it is a mistake, because it unquestionably eventually means that a very large proportion of the profession is going to be engaged in the practice of medicine in these institutions purely as federalized institutions, that men are going to be transported from their homes long distances where they will receive a standardized treatment that is objectionable in every way for acute illnesses, and as soon as we can make this evident to our friends and associates in the great military organizations, I think we will have no trouble in securing the necessary reform. It is for that reason that I bring it to your attention, that you may bring it to the attention of the Legion posts, because our Legion in Kentucky is, I think, probably the best led and the best managed state organization in the country. There is a thoughtful, patriotic, splendid group of young men in charge of it. They are forward-looking and they are big enough to be able to grasp this or any other situation for the benefit of the people of the country.

I think it is very important that we secure their approbation and know that in the various meetings of the National Rehabilitation Committee recently they have taken a very strong stand in support of our desires in the matter. As long as we are led by men like Frank Rash and men of that type, we need feel no anxiety about what the Legion is going to do, for they are rather anxious to do a great deal for us in the Commonwealth of Kentucky.

CHAIRMAN GARDNER: It is hoped that Dr. Woodard will send in his report to be published in the JOURNAL. No action is necessary at this time.

I have appointed Dr. E. R. Palmer and Dr. Howard of Harlan to escort Dr. W. M. Martin, our President-Elect, into the room.

I have the pleasure now of introducing to you our President-Elect, Dr. W. M. Martin, Harlan. (Applause).

PRESIDENT-ELECT W. M. MARTIN: Gentlemen, I assure you that I have not words to express my gratitude for the election by the House of Delegates. I feel my inadequacy very much, but I assure you that with the co-operation of the doctors of this state, which I know I will have, we will make the administration one of the best. I want you to understand that I feel my weakness, but I feel my strength with the co-operation of this great body of splendid medical men. I am sure there is no other medical society in the world of which I would rather be President than that of Kentucky. (Applause).

CHAIRMAN GARDNER: I believe Dr. Bradley has a matter to present to the society.

ERNEST BRADLEY: Mr. Chairman, while in general physicians have suffered during this period, it seems to me perhaps the laboratory men, the men who engage exclusively in laboratory work, have been feeling a little hard hit, and some of them who are friends of mine have asked me to introduce a resolution which I will read to you.

"WHEREAS, The private medical laboratories under the supervision or direction of a duly licensed physician, especially trained in clinical laboratory work, is a necessary and legitimate field in the practice of medicine, and

"WHEREAS, The State Board of Health has extended its activities to such an extent that their laboratories have, during the past year, 1931, done more than forty-five thousand Wassermann and Kahn reactions, and other tests in proportion, irrespective as to whether the patients were indigent or not, representing the vast majority of the clinical laboratory work of the state, most of which does not come under the jurisdiction of public health work, and

"WHEREAS, The said private laboratories in conjunction with hospital laboratories are fully prepared and willing to take care of such, including the indigent if necessary, and should take care of such work, and

"WHEREAS, The said activities on the part of the State Board of Health, entering into unfair competition with licensed physicians making clinical pathology a specialty and forcing the expense of private laboratory work on the taxpayers under the guise of public health, have rendered the practice of clinical laboratory work no longer a profitable specialty;

"WHEREAS, Public health work is essential and approved where its activities are confined to public health work, therefore be it

"RESOLVED, That the House of Delegates of the Kentucky State Medical Association recommend that the State Board of Health confine their laboratory work to epidemiology, state institutions, indigent patients, and authorized public health organizations."



Mr. President, I move the adoption of that resolution.

The motion was seconded.

A. T. McCORMACK: Mr. Chairman, I am rather sorry this resolution was not presented to the State Board of Health first because I think the difficulty could have been solved easily, but this resolution presents a matter of considerable moment to the profession of the state.

The essential value of the Wassermann is of interest to every practitioner of medicine in Kentucky. To say that the work shall only be done for in cases presenting public health problems is saying exactly what the requirement of the laboratory is at present. We have always requested our physicians to send in work to the private laboratory. It has been written in editorials, it has been passed in resolutions before this body time after time, that the laboratories are for the acute cases, for the indigent cases, and for the state institutions, presenting public health problems. That is a regulation that has been given to both laboratories, but there is no way on earth to enforce it except through the physician. The man who sends in the specimen is the only one who can determine whether that patient is indigent or not. It is manifestly impossible for Dr. South or the laboratory at Lexington to go out and find out whether the person is indigent or not.

I don't see how it is enforceable, in the first place. In the next place I believe it is the wrong attitude for the profession to take in the matter as an implied reproof to the State Board of Health and its laboratories which have always attempted to do this very thing.

The large number of Wassermanns that are done at Lexington (and all of them are done at Lexington because it would be manifestly unwise and uneconomic to have two Wassermann laboratories) come from three main sources: the state institutions, both the asylums and the penitentiaries, furnish a large number because they have a routine Wassermann for every inmate and have them at certain intervals if they ever have been positive.

In the part pay clinics in the various counties, the clinician being selected by the county society, and nobody is treated at these part pay clinics except by the written request of a physician that this case is indigent and that he wants the case treated. On those cases Dr. Hancock requires a Wassermann at certain intervals during and at stated intervals following treatment. Of course they are indigent cases. They furnish far and away the bulk of the cases. I expect the clinic at Ashland and one at Louisville furnish practically 25 per cent. It looks like a tremendous number, but the number of

duplications make it up.

So many of the patients who are just able to pay their family physicians and who do not go to the part pay clinic, haven't sufficient money to pay for Wassermanns in laboratories, so, as a practical matter, it means they would not be done. In a large number of suspicious borderline cases Wassermanns are being done where they wouldn't be done if it cost any money, because in these difficult times so few people are able to pay.

We have had one rather serious difficulty, on the other hand. Recently in several different cases we have had reports of Wassermann specimens being sent in to the laboratory for examination and the family physician charging for that report. Of course, that is not square and ought never to be done. If anybody is going to be paid for making a Wassermann examination, a laboratory man ought to be paid for it, and wherever it is possible to do it, wherever the patient is able to pay, it is not square to send any specimen to the state laboratory for examination if a serious health condition is not involved. That is the purpose of the state laboratory; we are trying to preserve it for that purpose as far as possible.

I would very much dislike to see us adopt a hard and fast rule in the matter, because we would be bound by your resolution and it would handicap the laboratory at Lexington very greatly, as I see it, for unless you give us a procedure by which we are to determine that the patient is indigent, I don't see how we would exactly be able to do one of the other two things.

J. H. PRITCHETT: Will Dr. Bradley read the resolution again?

ERNEST BRADLEY: I will say as an introduction to this that I don't think the laboratory men meant any discourtesy to the State Board of Health, because I think two of them who were on the committee, Dr. Purnell and Dr. Maxwell, did make a trip to Louisville to see Dr. McCormack, but unfortunately he was called to see the Governor that day and didn't see them. They felt if a resolution of this sort came before the House of Delegates, the physicians of the state would understand their attitude and would perhaps co-operate with them in seeing that the patients who are able to pay for laboratory work at least did not have their Wassermanns sent to the Public Health laboratory, but rather to private laboratories. You can see that if the State Board of Health takes up surgery, eye, ear, nose and throat, medicine, children's diseases, and all of it, there won't be any question about putting them out of this sort of work.

I used to be in the laboratory line myself, although not exclusively so, and every laboratory man knows that his chief source of

revenue is from the Wassermann reaction. All of these private laboratories have to run a certain number of Wassermann tests every week. It would be much more profitable to them if they could get a larger number. We know that a great many private physicians who have patients who are able to pay their bills, do take the blood and send it to the Public Health laboratories. I know that is true in Lexington, and it probably is true everywhere.

These laboratory men told me that in Indiana they had been able to accomplish a pretty good result by having the physicians certify that the patient was indigent and that they themselves were not receiving anything for their services when the Wassermann specimen was sent in. I think it is fair to the laboratory men that this should be taken up by the House of Delegates.

Dr. Bradley reread the resolution.

J. H. PRITCHETT: You recall the story of Tom Sawyer whitewashing a fence, how his friends came to jeer and remained to whitewash. I gathered some inkling of this situation and I came to hear it and smile, and I remain to be interested tremendously in this movement. Being neither a laboratory man nor a member of the State Board, I think I am particularly fitted to say just a few words along this line.

There seems to be a rift on the part of the laboratory men—rather I might say a spirit of unrest as regards this matter. It strikes me that this resolution that Dr. Bradley has offered is a very simple thing, not asking for a great deal, and not, in a great measure, curtailing the work that is being done so wonderfully by the State Board of Health. It seems to me at the same time this may tend to seal this rift and make better friends of the laboratory men for the state. After all, they are not asking a great deal. For that reason, this measure seems to me to be very appropriate.

C. A. Vance took the chair.

A. T. McCORMACK: Mr. Chairman, I don't see it. The statement is clearly made in that resolution that there is unfair competition with the practitioner on the part of the State Board of Health. In view of that I consider it a distinct reprimand for what we have done and I am not conscious of having done anything that is wrong. I object very seriously, as far as I am concerned, and I believe every member of the Board would, to passing a resolution that makes such a statement, and I believe it is unwarranted.

ERNEST BRADLEY: This resolution was prepared by the laboratory men, but I think as their representative in introducing it I would be perfectly willing to strike that out. I didn't like it myself that the House of Delegates should reprimand the Board, and I

don't like the wording "forcing the expense of private laboratory work on the taxpayers under the guise of public health, have rendered the practice of clinical laboratory work no longer a profitable specialty." I should think we might leave that out, so it would read, "the said activities on the part of the State Board of Health, entering into competition" instead of "unfair competition," "with licensed physicians making clinical pathology a specialty and forcing the expense of private laboratory work on the taxpayers," omitting "under the guise of public health," "have rendered the practice of clinical laboratory work no longer a profitable specialty."

A. T. McCORMACK: Why not omit that paragraph?

ERNEST BRADLEY: With the consent of the seconder, I withdraw that paragraph entirely, because I don't think it will emasculate the resolution. (Consent).

O. O. MILLER: I realize the extreme difficulties in carrying on Public Health work to avoid some conflict with the general practitioner, but I do feel that when a resolution is introduced like this, it should bring with it recommendation for the correction of the said abuse, and I therefore move you that this recommendation be referred to the State Board of Health with power to act on it and report back to the House of Delegates at the next meeting.

The motion was seconded.

CHAIRMAN VANCE: Do you make that as an amendment?

O. O. MILLER: Yes.

CHAIRMAN VANCE: Would that do away with the resolution entirely?

W. E. GARDNER: That would be an amendment to the original motion that would be adopted. Dr. Miller's motion would be a substitute.

ERNEST BRADLEY: I don't know whether I am in order in making a motion to amend the amendment. Am I?

CHAIRMAN VANCE: Yes.

ERNEST BRADLEY: I will amend that amendment by saying that it be referred to a committee of the House of Delegates to report back to the State Medical Association.

CHAIRMAN VANCE: That would be a year.

ERNEST BRADLEY: I don't care how long it is. We are the party that this resolution is brought up to. If they want to bring it up to the State Board of Health they can do it. They want to get some action from the State Medical Association, which is a separate organization from the State Board of Health.

I will move as an amendment to the amendment that it be referred to a committee to be appointed by the President to be considered as to ways and means for carrying it into effect, and to report back to the next



meeting of the House of Delegates.

CHAIRMAN VANCE: And in the meantime they can take it up with the Board of Health.

ERNEST BRADLEY: Yes, surely, and the State Board of Health would co-operate with them, I know. There are some ways it could be helped. We can't change it all, we know that.

O. O. MILLER: I would be willing to accept that recommendation if it would be agreeable to my second. (Applause).

W. B. ATKINSON: I believe we are going into some class legislation. I believe we should include also in this thing the Crippled Children's Commission. I am not saying that they go into unfair competition with the rural doctors, and I am not saying that they are doing the wrong thing, but this Commission will go in one section and take everybody, regardless of finances. They can drive up there in a \$5,000 automobile.

CHAIRMAN VANCE: I would rule on your presentation that it is out of order because it has nothing to do with the matter we are discussing. I believe you had better bring that up separately.

W. B. ATKINSON: The only thing I want to say is that we are enacting legislation on one class which is minor. We have heard so much about how the general practitioner is losing out, and I believe that is one of the reasons.

H. H. HUNT: There seems to be so much misunderstanding about this, that I want to make a motion that we table this resolution.

The motion was seconded.

W. E. GARDNER: The only way to discuss this is to defeat the motion to table. When a motion is made to table it doesn't necessarily have to prevail. If you want further discussion, you defeat the motion to table.

The motion to table was put to a vote, and was lost.

CHAIRMAN VANCE: We will resume discussion on the amendment to the original motion.

W. E. GARDNER: I believe we are all in accord with the spirit of Dr. Bradley's resolution. It will go into the record as his resolution, although he is representing another group. I think we all know that Dr. Bradley would not bring anything before the Society that is not sane and sound. I think there is nothing in this resolution as finally corrected that reprimands the State Board of Health. It simply calls attention to a tendency that may constitute an abuse. I believe it would be a good idea for the JOURNAL in its editorial columns to call attention to the people over the state to what the rules of the State Board are in regard to the examination of free specimens. I think from time to time the profession throughout

the state should be reminded that these cases should not be sent in unless they are bona fide, and it would save a lot of misunderstanding and criticism.

I am heartily in favor of the resolution as it was finally changed. It is a question of procedure that the motion go before the committee and be presented to us next year. We have a whole year to think about it.

H. G. REYNOLDS: Does the doctor who sends in these requests for examination sign any sort of understanding or agreement that this patient is indigent?

A. T. McCORMACK: He does, but very frequently that is not signed and it is not sent in.

H. G. REYNOLDS: That is only a moral obligation on his part, then, but it does put him in a position where he is supposed to do it.

A. T. McCORMACK: Of course, an editorial has been written time after time, urging that patients who are able to pay paralyze the private laboratories. We publish the names of all the laboratories in the state (there are only a few of them) so they may know where they are.

The resolution as corrected does a lot more than it seems to do. I think it would stop us immediately from making all our biologicals. They are made for the benefit of the physicians and people of the state; they are not made as any public health procedure.

You can buy typhoid vaccine—\$1 apiece. We make it for nothing and distribute it for nothing to the doctors, on condition that those who get it will use it for the indigent, but they also use it for their paying patients and charge for its administration and don't buy it. That is in competition with private laboratories. We make the bacteriophage and distribute it free; that is in competition with the laboratories. If the doctors of the state want to stop that, it is their privilege, but that stops all of that work that we are doing. It would have cost the people of the State of Kentucky this year about \$350,000 to have purchased from the laboratories the vaccines and other biological products that have been manufactured by the State laboratory.

I don't think you have kept in mind the relationship between this Association and the State Board of Health. Whenever you pass a resolution here it is binding on the State Board of Health. We are your creatures. The responsibility for all public health procedures and practices in Kentucky is on this Association. Any resolution passed by this House of Delegates is binding on the State Board of Health, and we carry it into effect.

W. E. GARDNER: It isn't technically binding on the State Board of Health. They can do what they want to do.

A. T. McCORMACK: Certainly, but they are

going to do it. While it is not technically binding, if the members of the State Board are not doing what you want them to do, you nominate somebody that will do what you want.

ERNEST BRADLEY: I think if it says they recommend that the State Board of Health activities be confined to epidemiology it would let you in on your typhoid, you diphtheria antitoxin and those things. "Recommend that the State Board of Health confine their laboratory work to epidemiology, state institutions, indigent patients, and authorized public health organizations."

I think under epidemiology you would be allowed to distribute vaccine, typhoid vaccine, toxin antitoxin.

A. T. McCORMACK: We may not be quite legally your creature, but morally we are and we are going to carry out your instructions. That is the only way I know how to play ball with the medical profession of this state. I think the finest thing in our legislation is the fact that the General Assembly of the Commonwealth of Kentucky has put on the shoulders of the medical profession the responsibility for public health procedures, and that this House of Delegates when it passes a resolution in regard to any principle binds the State Board of Health, and we not only want to but intend to carry out your instructions and your recommendations.

We would like to have you consider carefully the whole implication, and that will be done by the committee, of course. I think that is a wise procedure to refer it to a committee of this House for consideration and action. We are purchasing wholesale each year an enormous quantity of salvarsan. A great deal of that is being distributed free, and all of it at cost to the part pay clinicians and to the private practitioners of the state. It saves a tremendous lot of money and many a patient is able to pay for treatment that would not be able to pay for it if he had to pay for the medicine purchased. That is a question that I think the profession ought to consider. We want you know just exactly what we are doing. We have felt all the time a good deal of pride in the fact that we were able to provide our doctors with this material. We have taken the greatest pride in the world in the increase of our laboratory facilities. We believe that it is in the interest of public health. We believe that thousands of borderline cases are having Wassermanns done today that would not be having them done if they have to pay \$5 for them, or even \$2. That is the way we have felt about it, but if the profession feels differently from that, we want to know it; it is the profession's ideas that are going to control our activities and our laboratory. You tell us what you want

done and that is exactly what we are going to do.

J. D. SORY: I practice in a mining community. At least 50 per cent of the syphilis cases I treat in this day and time come to me and tell me that they do not want blood Wassermanns made. If we tell them it is going to cost \$5 to have a blood Wassermann made they won't have it. If we tell them it is not going to cost them a cent, that it is free, they will have it and we feel we are protecting the public down there by getting these Wassermanns made when they would not have them made otherwise. I think this thing is a dangerous proposition.

S. P. OLDHAM, Owensboro: We have a committee of our county board of health to make Wassermanns and give typhoid vaccines. We agreed that any doctor in any vicinity of Daviess County should give any indigent patient such vaccines as might be necessary, but before this can be done, if any doctor wishes to have his patient sent to the board of health, he is to write to the officer of the county board and they in turn will give the treatment. That eliminates the difficulty in our county. No individual can get a Wassermann test, vaccine or serum unless they make a statement to the county physician and this in turn is sent to the health officer.

E. M. EWERS: Something similar has happened in our county, but the unfortunate part that I noticed was that a great many patients were sent to the health department because it was easier to have the health department do it, they had equipment ready. There were people who could pay sent with orders to the health department for Wassermanns. I knew the cases, and they should not have been sent. As Dr. McCormack says, it is up to the doctors in private practice to see who does and who doesn't pay.

I think the resolution is completely out of order. It is up to the profession and not to the State Board of Health.

V. A. STILLEY: I want to endorse what has just been said. It is up to the doctors altogether. It is up to the doctor to say whether he thinks the case is indigent or not, and there is many a poor devil who won't get a Wassermann made if this resolution is adopted.

PRESIDENT-ELECT MARTIN: Gentlemen, I think we are treading on pretty dangerous ground. If this resolution is passed, there are more indigent people in the State of Kentucky today than ever were known who will be affected. In our county we have given over 15,000 shots of typhoid inoculation. I have gotten myself from the State Board of Health over 40 bottles. I have used most of them. I have never gotten one penny for giving any of that antitoxin, so I don't believe that we should censure the State Board of Health. I



have always made, not only in the House of Delegates and our Council meetings, but also in the state legislature, a fight for our State Board of Health. When we have men come from New York and various parts of the United States acknowledging that we have one of the greatest state boards of health that there is in any state in the Union, I feel that we should back that State Board of Health to the limit.

If the doctor will be honest with the State Board of Health, all this trouble will stop. There are laboratories in Louisville which I send my specimens to for patients that are able to pay. Those that are not I send to Lexington. In the last twelve months I have gone down into my own pocket and bought the greater part of salvarsan for my patients and paid for it myself.

I say I think we are on dangerous ground when we try to unravel this problem. Our indigent people must be taken care of, that is all there is to it. I know the doctors in every other county in the state are doing just as much for the people who are indigent and the people who used to pay who can't now. I have people who used to pay me \$100 who can't pay me a nickel now, and I feel it is my duty to take care of them. I think it would be wrong now for us to make any change in this, except in this way: if there have been dishonest doctors in the State of Kentucky who have been dishonest with the State Board of Health, let them make the change. That is all I have to say and I think

that it is right.

A. M. LEIGH: First and last it is up to the individual doctor. I have sent quite a number of Wassermanns to the State laboratory and I have never yet sent one if the patient was able to pay for it. I may have been mistaken sometimes, but I have never intentionally sent them when they were able to pay; I always send them to the private laboratories if they are able to pay.

To pass this resolution will handicap the doctor who has to deal with the indigent patient. If syphilis is not a public health problem I don't know what is. It is one of the most important public health problems, not only in Kentucky, but all over the country.

CHAIRMAN VANCE: Are you ready for the question? We will first vote on the amendment to the motion. The amendment was made by Dr. Bradley and accepted by Dr. Miller, to appoint a committee of three, to be appointed by the President, to consider this matter and take it up with the State Board of Health or in any way that they see fit and report back to the next meeting.

The amendment was adopted, with no dissenting votes.

CHAIRMAN VANCE: We will next vote on the motion as amended. You understand that thoroughly. All in favor of the motion will please say "aye," all opposed "no."

The motion was carried as amended.

The Council reported, with its approval, the following bills and pay roll and upon motion, duly seconded, they were approved for payment.

### ACCOUNTS OF THE KENTUCKY STATE MEDICAL ASSOCIATION

1932	
Sept. 30—Voucher Check No. 1.....	\$135.00
A. T. McCORMACK, M. D., Louisville.	
To September salary, Secretary.	
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 2.....	\$100.66
L. H. SOUTH, M. D., Louisville	
To September salary, Business Manager.....	
To expenses to Crab Orchard.....	
To expenses to Lebanon.....	
	90.00
	4.91
	5.75
	100.66
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 3.....	\$90.00
J. F. BLACKERBY, Louisville.	
To September services rendered Committee on Public Policy.	
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 4.....	\$75.00
ELVA GRANT, Louisville	
To September salary, Bookkeeper	
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 5.....	\$54.10
B. P. EUBANK, Bowling Green	
To auditing books and accounts of A. T. McCormack, M. D., Secretary, and Marshall McDowell, M. D., Treasurer, and Pauline C. Halev, Treasurer, Woman's Auxiliary, and Mrs. Edna B. Krieger, Business Manager of "The Quarterly," for the period September 1, 1931, through August 1, 1932.....	
To railroad fare Bowling Green to Louisville and return and meals.....	
	50.00
	8.10
	58.10
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 6.....	\$35.00
AMERICAN MEDICAL ASSOCIATION, Chicago	
To 2,500 inserts of Dr. Philip F. Barbour's picture for Annual Number, October, 1932, Journal	
Approved by Council and Ordered Paid by House of Delegates.	
Sept. 30—Voucher Check No. 7.....	\$2.10
E. H. ROEDERER, Louisville	
To 12 ribbons for Annual Meeting	
Approved by Council and Ordered Paid by House of Delegates.	

Sept. 30—Voucher Check No. 8.....	\$45.30	
F. & V. MANUFACTURING CO., East Providence, R. I.		
To 300 bangles, "Louisville 1932," @ 15c each.....	45.00	
To postage.....	.30	
	<u>45.30</u>	
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 9.....	\$54.00	
COURIER-JOURNAL JOB PRINTING COMPANY, Louisville.		
To 4M Membership Cards, for 1933 and 1934		
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 10.....	\$19.14	
MEFFERT EQUIPMENT COMPANY, Louisville		
To 1 M 4x6 Record Cards.....	1.75	
To No. 548 Index Books.....	.40	2.15
	<u>2.15</u>	
Less 10%.....		<u>.21</u>
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 10-A.....	\$45.65	
CHARLES A. VANCE, M. D., Lexington		
To expense as Councilor, 10th District		
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 11.....	\$17.52	
LOUISVILLE POSTMASTER, Louisville		
To postage on letters		
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 12.....	\$12.34	
MUSH-LEWIS COMPANY, Louisville		
To 3 Cuts.....	11.34	
To sawing electro in five parts.....	1.00	
	<u>12.34</u>	
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 13.....	50.00	
CLARENCE NEUMANN, Postmaster, Bowling Green		
To postage on Journals		
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 14.....	\$99.87	
THE TIMES-JOURNAL PUBLISHING COMPANY, Bowling Green		
To 2,200 84-Page September Issue.....	490.60	
Less 5% discount.....	24.53	
	<u>466.07</u>	
To Inserts and Scoring.....	8.50	
To Envelopes.....	15.00	
To Printing Envelopes.....	2.30	
To 40 Changes.....	8.00	
	<u>499.87</u>	
Less Credit by Check No 127, 8-31-32.....	400.00	99.87
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 15.....	\$7.53	
MAYME SULLIVAN, Louisville		
To reimbursement for express on Journal material, Journals and Treasurer's books, 7-23—3-90-32		
Approved by Council and Ordered Paid by House of Delegates.		
Sept. 30—Voucher Check No. 16.....	\$540.70	
THE TIMES-JOURNAL PUBLISHING CO., Bowling Green		
To 2,400 80-Page October Issue.....	485.40	
To 69230 Ems. set to 6 point.....	69.00	
To Insert, no Scoring.....	5.00	
To 50 Changes.....	6.00	
	<u>565.40</u>	
Less 5% discount.....	28.27	
	<u>537.13</u>	
To Printing Envelopes.....	2.30	
To Postage.....	1.27	540.70
Approved by Council and Ordered Paid by House of Delegates.		
Oct. 31—Voucher Check No. 17.....	\$150.00	
A. T. McCORMACK, M. D., Louisville		
To October salary, Secretary.....	135.00	
To expenses.....	15.00	
	<u>150.00</u>	
Approved by Council and Ordered Paid by House of Delegates.		
Oct. 31—Voucher Check No. 18.....	\$106.85	
L. H. SOUTH, M. D., Louisville		
To October salary, Business Manager.....	90.00	
To expense to Bowling Green, September, and State Meeting expense.....	16.85	
	<u>106.85</u>	
Approved by Council and Ordered Paid by House of Delegates.		
Oct. 31—Voucher No. 19.....	\$90.00	
J. F. BLACKERBY, Louisville		
To October services rendered Committee on Public Policy		
Approved by Council and Ordered Paid by House of Delegates.		
Oct. 31—Voucher Check No. 20.....	\$102.20	
ELVA GRANT, Louisville		
To October salary, Bookkeeper.....	75.00	
To Honorarium.....	20.00	
To State Meeting Expense.....	7.20	
	<u>102.20</u>	
Approved by Council and Ordered Paid by House of Delegates.		



Oct. 31—Voucher Check No. 21.....		\$66.01	
MAIME SULLIVAN, Louisville			
To Honorarium .....	20.00		
To State Meeting Expense.....	\$46.01		
	66.01		
Approved by Council and Ordered Paid by House of Delegates.			a
Oct. 31—Voucher Check No. 22.....		\$23.35	
RUTH FLAGG, Louisville			
To Honorarium .....	20.00		
To State Meeting Expense.....	3.35		
	23.35		
Approved by Council and Ordered Paid by House of Delegates.			
Oct. 31—Voucher Check No. 23.....		\$20.00	
REBECCA CASSELL, Louisville			
To Honorarium .....			
Approved by Council and Ordered Paid by House of Delegates.			
Oct. 31—Voucher Check No. 24.....		\$20.00	
EMILY STOECKER, Louisville			
To Honorarium .....			
Approved by Council and Ordered Paid by House of Delegates.			
Oct. 31—Voucher Check No. 25.....		\$25.00	
J. G. OWSLEY, Lily			
To Honorarium .....			
Approved by Council and Ordered Paid by House of Delegates.			
Oct. 31—Voucher Check No. 26.....		\$104.79	
JOHN LOVETT MORSE, M. D., Boston			
To State Meeting Expense .....			
Approved by Council and Ordered Paid by House of Delegates.			
Oct. 31—Voucher Check No. 27.....		\$2.00	
D. M. GRIFFITH, M. D., Owensboro			
To Expense as Councilor, 2nd District .....			
Approved by Council and Ordered Paid by House of Delegates.			
Oct. 31—Voucher Check No. 28.....		\$96.00	
THE FRANKLIN PRINTING COMPANY, Louisville			
To 750 Copies 1932 Programs—32 Pages and Cover .....			
Approved by Council and Ordered Paid by House of Delegates.			
Oct. 31—Voucher Check No. 29.....		\$10.02	
BUSH-KREBS COMPANY, Louisville			
To 1 Cut and 2 Zinc Etchings .....			
Approved by Council and Ordered Paid by House of Delegates.			
Oct. 31—Voucher Check No. 30.....		\$530.60	
THE TIMES-JOURNAL PUBLISHING CO., Bowling Green			
To 2,200 76-Page November Issue.....	451.40		
To Insert and Scoring.....	8.50		
To 30 Changes .....	6.00		
To 10,940 Ems set 6 pt. tab.....	16.40		
	482.30		
Less 5% discount.....	24.00		
To Envelopes.....	15.00		
To Printing Envelopes.....	2.30		
	475.60		
Less Credit by Check for setting up Tables .....	6.00		
	469.60		
To 12,000 Letterheads—Secretary.....	45.00		
To 500 Letterheads and 500 Envelopes .....			
Dr. Vance, Chairman of Council.....	6.00		
To 250 Letterheads and 250 Envelopes, .....			
Dr. Martin, President-Elect.....	4.00		
To 500 Letterheads and 500 Envelopes, .....			
Dr. Barbour, President.....	6.00	61.00	530.60
Approved by Council and Ordered Paid by House of Delegates			
Oct. 31—Voucher Check No. 31.....		\$12.50	
HINES & COOKE, Bowling Green			
To premium on bond for Treasurer, Marshall McDowell, M. D., for one year .....			
Approved by Council and Ordered Paid by House of Delegates			
Oct. 31—Voucher Check No. 32.....		\$1.50	
THE FLAX COMPANY, Dayton, Ohio			
To 3 Typewriter Ribbons .....			
Approved by Council and Ordered Paid by House of Delegates			

SECRETARY McCORMACK: I would like to move you that the gratitude of the Association be extended to our retiring President, Dr. Reddick, and to the President, Dr. Barbour, and that we pledge to him and to Dr. Martin for the scientific work of the Association during the year our unstinted support and our unanimous feeling of gratitude for the fine work they have already done and our confidence in what is going to be done, and that we are going to follow them over the

fence and put over the greatest year we have had in medicine in Kentucky.

The motion was seconded and carried unanimously.

CHAIRMAN VANCE: If there is nothing further, a motion to adjourn is in order.

L. H. SOUTH: I so move.

The motion was seconded and unanimously carried, and the meeting adjourned sine die at 9:45 o'clock.

A. T. McCORMACK, Secretary.

## ORIGINAL ARTICLES

## ANNUAL ORATION

## PEDIATRICS AND PEDIATRICIANS\*

JOHN LOVETT MORSE, M. D.

President, American Academy of Pediatricians, Boston, Massachusetts.

When Dr. Barbour asked me last May to give a "popular" address at the meeting of the Kentucky State Medical Society, I accepted with alacrity, thinking that my audience would be entirely lay and that I could amuse myself, and perhaps incidentally instruct them, by talking about spinach and bananas, sun tan, bare legs and things of that sort. Later, however, I learned that my audience was to be largely professional and that I was expected to take up more serious, if not more important, matters. Consequently, in accordance with Dr. McCormack's suggestion, I will try to say something about pediatrics and pediatricians.

What is pediatrics? It has nothing to do with the feet, as so many people suppose. Even President Eliott of Harvard once asked my predecessor, Dr. Rotch, why the department dealing with children was called the Pediatric Department, when it had nothing to do with the feet. A little knowledge is surely a dangerous thing! The word is derived from the Greek (*peis*), child, not from the Latin *pes*, foot, Gould's medical dictionary defines pediatrics as "the medical treatment of children." This definition is, to my mind, altogether too narrow. As I conceive it, pediatrics includes as well the study of the child and its development, both physical and mental, from the time of conception to adolescence and the carrying out of all possible measures to insure normal development and to prevent disease.

Pediatrics is a relatively new specialty. Although not one of the pioneers of pediatrics in this country, I am now one of the oldest ten or a dozen pediatricians still alive and active. Incidentally, the pioneers—Jacobi, Holt, Rotch, Rathford—as well as Foreheimer and Osler, who are better known in connection with internal medicine, were not so much older than I but that I knew them all intimately. When I began to devote myself exclusively to pediatrics, some thirty odd years ago, there were certainly not more than one hundred pediatricians in the United States, and very few of them devoted themselves entirely to pediatrics. Now the large cities are overrun with them and there is hardly a town of any size, at any rate in the Eastern States, that has not at least one pediatrician. The demand has increased

tremendously, but the supply has increased faster than the demand. Pediatrics for some years offered one of the great opportunities in medicine. It does not now. The opportunity at present is for physicians who will specialize in the diseases of old age.

The development of the interest in pediatrics and the increase in the facilities for the care of sick infants and children during the last forty years has been phenomenal. I will not weary you with statistics, but will merely cite a few examples. Those who wish accurate figures can find them in the reports of the White House Conference.

Nothing shows more conclusively the growth in the interest in pediatrics than the increase in the number of special pediatric societies. The section on diseases of children of the American Medical Association was established, I think, about 1880. For some years it was sparsely attended and evoked little general interest. At the last meeting of the Association at New Orleans I am told that the attendance at this section was larger than that at the section on medicine. The American Pediatric Society was founded in 1889 and was for a considerable number of years the only special society devoted to the study of pediatrics. Now there are a number of national societies, notably the American Academy of Pediatrics, several flourishing regional societies, like the Central States and the New England pediatric societies and many state and local organizations. The American Journal of Diseases of Children lists seven national, eleven state and twenty-four local societies.

The Archives of Pediatrics was, I think, the first medical journal devoted exclusively to children published in this country. The current volume is numbered 49. We now have in addition the American Journal of Diseases of Children, which first appeared in 1911, each number of which is almost as large as a book, and the new Journal of Pediatrics, the organ of the American Academy of Pediatrics.

Pediatrics was for many years taught, or supposed to be taught, by the departments of obstetrics or of the diseases of women and children. It was not until some time in the eighties that any progress was made toward establishing it as a special department or subdepartment. The Harvard Medical School was, if not the first, among the first to do this, Dr. Rotch having been made assistant professor of pediatrics in 1888 and full professor in 1893. Since that time the importance of the pediatric department in the medical schools has steadily increased. At Harvard it has for the last 20 years at least ranked with medicine and surgery as one of the three major departments. There is still

\*Read before the Kentucky State Medical Association, October 3-5, 1932.



much room, however, for improvement in the teaching of pediatrics in many of our medical schools. The Committees on Medical Education of the White House Conference and of the American Academy of Pediatrics are doing their best to see that the teaching in these schools is brought up to standard.

The facilities for the care of sick children were for many years very meagre. The first hospital in this country for the care of children exclusively was established in Philadelphia in 1855, the next in Chicago in 1865 the next in Boston in 1869. The Infants' Hospital in Boston was opened in 1883. Now there are special hospitals for infants and children in all our large cities and most of the general hospitals in the smaller cities have special wards for children. The number of these hospitals is not so important as that they show that both physicians and the public realize that infants and children need special care and treatment.

The pediatrician is usually spoken of as a specialist. He really is not. In fact, he is now the only general practitioner left. He merely limits his practice to those younger than adults. Nevertheless, the pediatrician is in a sense a specialist, as special training in the anatomy, physiology, development, and pathology of disease in early life is necessary. He requires not only the ordinary medical training but also special training in infants' and children's hospitals, as well as in preventive pediatrics, before he is fit to practice pediatrics. Personally, I think he ought to do a general practice for a time, or at least have a general medical hospital service, before he takes up the study of pediatrics as a specialty. Otherwise he will be too narrow and his point of view too limited. Few of our teachers, however, will agree with me. They believe that an intensive training in pediatrics alone is better. This may, perhaps, be so, if the pediatrician is to devote himself entirely to hospital or laboratory work. I am certain that it is not so, if he intends to practice. No physician is justified in calling himself a pediatrician simply because he has taken a few postgraduate courses, is fond of children, or likes to treat them.

The recently formed American Academy of Pediatrics admit to its ranks only those who are believed to be thoroughly qualified pediatricians. It is probable that it will not be long before every such man is a member. The natural corollary will then be that any physician claiming to be a pediatrician who is not a member is not qualified. The objects of this Academy are largely altruistic and "none of them are for pecuniary profit." They are, in brief, "to foster and stimulate interest in pediatrics and correlate all aspects of the work for the welfare

of children which properly come within the scope of pediatrics" and "to establish and maintain the highest possible standards for pediatric education in medical schools and hospitals, pediatric practice and research."

As you all know, there is much discussion going on now as to whether higher degrees should be required for the practice of the various specialties and as to whether specialists should be licensed or certified. Time will tell what the decision will be. Personally, I am not worried about these matters, as I am sure that the various bodies which are now considering them will not only see that there is no lowering of the standards required for specialists, whether pediatricians or not, but will provide for raising them. What troubles me is the lack of knowledge of and of interest in children among the physicians now in practice. While, as I have said, there is no lack of pediatricians in our cities and large towns, nevertheless a large proportion of our children must necessarily be taken care of by what is commonly known as the general or family practitioner. This is, I believe, as it should be. The properly trained physician should be able to watch over and direct the development of the normal child and to take care of its minor ailments. If he is the "family physician," he ought to be able to do it as well, or even better, than a pediatrician, because he knows the child's family, its inheritance and its environment better than any outsider can. A very large proportion of the older physicians, however, did not get proper training in pediatrics when they were students, especially as regards the normal child and preventive pediatrics, and are, therefore, not qualified to superintend the care and development of normal infants and children. Furthermore, many of them are not interested. If they do not get interested and learn how to take care of children, they will lose their patients to younger physicians, who are better trained, and to the pediatricians.

This defect in medical training is now being rapidly corrected, largely as the result of the White House Conference and the efforts of the American Academy of Pediatrics. The coming generations of physicians will, in consequence, be better qualified. In the meantime, however, more attention should be paid to pediatric questions at the meetings of local, county and state societies and short graduate courses and extension courses should be given, in order to correct the defects in the past medical training of the older physicians. The physicians in children's hospitals and the teachers in the medical schools should, moreover, do more than they are now doing to acquaint the physicians in their communities with the progress which

is being made in pediatrics. The doors of our hospitals and medical schools should always be open to the practitioner endeavoring to increase his knowledge of pediatrics.

Pediatricians have always practiced preventive medicine. In fact, they were the first to do this systematically and to appreciate its importance. They have, indeed, labored so strenuously to prevent disease in early life, and have succeeded so well, that they have to a considerable extent put themselves out of business. This is a fortunate or an unfortunate result, according to the point of view. They have always advocated vaccination against small-pox, and toxin-antitoxin for the prevention of diphtheria. In many instances they have been in advance of the public health authorities. The initiative for the purification of the milk supply was, for example, taken by pediatricians.

In the past, however, pediatricians practiced preventive pediatrics largely as individuals for individuals instead of as a group for groups. In consequence, their work attracts little or no attention. Neither the laity nor physicians in general took any interest in it. Since the World War, however, the attitude of the American public as to the child and its welfare has changed materially. It now demands that active measures be taken for the preservation, protection and guidance of children. In the past such measures have been undertaken and carried out largely by laymen without adequate medical advice. This was largely because of the lack of interest of pediatricians and physicians in general, although a few individuals helped them in their work. Unfortunately, some actively opposed it. Others were held back by the fear that they would be criticized by their professional brethren and accused of unethical conduct. The White House Conference has, I think, shown the laity their need of professional advice. I believe that they will welcome the aid and leadership of pediatricians in their undertakings. It is the duty of the pediatricians, and also of all physicians, to take part in the great movements which are going on in behalf of the welfare of American children. This is appreciated by the Executive Board of the American Academy of Pediatrics, the national organization of pediatricians, which voted that it is, "the policy of the Academy to create reciprocal and friendly relations with all professional and lay organizations that are interested in the health and protection of children." If you are unwilling or not inclined to take part in these great undertakings, may I ask you not to criticize, obstruct or ostracize those who do. These are strong words, but no stronger than the happenings in certain medical communities warrant.

Pediatricians, like other physicians, are a

simple folk. They are perhaps even more guileless than their professional brethren because of their intimate association with the "innocent" babies and little children. They are on every "sucker list." They are easy marks. Like the community at large they prefer to have someone else think for them. They are prone to believe the man who talks loudest and longest. Like the ladies, they must be in fashion. They must keep up with the procession and use the newest methods and the newest drugs, whether their usefulness has been proven or not. There is some excuse for them, however, in that if they do not use them, some of their competitors will, and the public, which is even more gullible than the pediatrician, is always impressed by the spectacular and is still looking for miracles, will leave them and flock to the man who has the most impressive layout and prescribes the newest and most expensive drugs. Many pediatricians prefer to read the broadsides of the drug houses and the manufacturers of foods to the Journal of the American Medical Association. Lots of them love to be instructed by the commercial travelers. I fear that some of them may believe what they hear over the radio. Some of them prefer to give canned foods to human milk; some think that all babies can be fed alike and that corn produces a better sugar than the human breast. Others believe that babies and children like spinach; others that bananas are a specific in coeliac disease. Some of them think that special window glass will prevent colds and that the ultraviolet rays "pep up" the system. Others forget that tanning is Nature's protection against the penetration of the sun's rays and that the laws of physics as to the equalization of the temperature of two contiguous bodies have not changed. In other words, like other physicians, while well-meaning, of fair judgment, and reasonably intelligent, they are sometimes credulous. Whatever their failings in these respects, the events of the last few years show, however, that they compare favorably with the great financiers, the noted executives and the captains of industry, to say nothing of those who are supposed to represent us at the Capitol in Washington.

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**Epispadias as Cause of Incontinence.**—Seynere reports the clinical history of a woman with considerable epispadias. He evaluates three surgical methods that could have been employed in this case and then shows why he combined vesico-vaginal interposition of the uterus with direct muscular plastic operation. He shows that only the combination of the two methods produces conditions that correspond to the anatomic requirements of a vesical closure. The treatment resulted in complete recovery.



## THE MEDICAL ASSOCIATION AND THE MILK SUPPLY\*

IRA V. HISCOCK, Ph. D.

Professor of Public Health Yale School of Medicine, New Haven, Connecticut.

The invitation of the Council of the Kentucky State Medical Association, through your honorable Secretary and esteemed State Health Officer, Dr. Arthur T. McCormack, was accepted with great pleasure. Kentucky has contributed much to the cause of public health in the United States, and the interest and support of its medical profession in the cause of sound community health measures are well recognized. Furthermore, the position occupied in state and national health affairs by your Secretary is one of leadership of the highest character, of which the State and the medical profession may be justly proud. I appreciate the honor of your invitation.

## THE PHYSICIAN AS HEALTH ADVISOR

The subject of milk is a fitting topic for consideration by physicians who occupy such an important place in the lives of the people of the Commonwealth. The modern physician is a key person in the program of community health and preventive medicine. Medical societies, through their public health advisory committees, render invaluable service to both official and non-official health agencies and administrators. Family physicians are in a unique position to give advice regarding matters of personal hygiene to those whom they serve. A recent county medical society bulletin issued to the membership carries the message: "The public deserves a service from the profession in the form of guidance in nutritional matters, and the physician should be as prudently minded, alert and discriminating in prescribing foods as in prescribing medicine, operations, and physiotherapy." Of particular importance is this question during these distressing times of economic pressure. When every dollar must go the limit and a balanced diet is challenged, milk helps the thrifty housewife to keep her budget and helps to maintain normal growth of children.

## MILK AND THE PUBLIC HEALTH

Milk is undoubtedly our most important food product. Probably no phase of public health administration has received more intensive study over a long period of years than methods for safeguarding milk supplies. The need for such study is apparent when one considers the value of milk as a food, the history of milk-borne disease, and the diver-

sity of methods of protecting this essential food.

## VALUE AND USE OF MILK

Continued investigations over a long period of years and practical experience have given conclusive evidence that cow's milk contains the essential food elements in a form which is easily assimilated. It is a most suitable food for consumption by man and indispensable in the diet of infants and invalids. Careful studies of the relative merits of artificial and breast feeding for infants indicate the superiority of the latter. Breast feeding of infants should be encouraged whenever possible. For infants who for one reason or another cannot be breast-fed, however, properly modified cows' milk remains the most popular. Furthermore, milk is an indispensable part of the diet of mothers who are carrying or nursing babies and of young children.

The most recent comprehensive report on the subject of Nutrition is contained in the publication of the Proceedings of the White House Conference on Child Health and Protection. An admirable resume of the findings of several committees was presented by Dr. Lafayette D. Mendel, who remarked that every writer on child welfare stresses the outstanding importance of milk in the diet of the young.

"It remained for modern science to transfer the dictum 'a quart of milk for every child' from the domain of empirical belief to the field of experimental justification. Some protagonists find the outstanding value of milk in that it is a 'protective food'; it is the best single supplement to insure that there shall be no outstanding inadequacies. Others look upon milk as an almost ideal foundation upon which an optimal diet can be built."

In connection with the problem of emergency food relief and child health, a valuable publication was recently issued by the U. S. Department of Labor, Children's Bureau and the U. S. Department of Agriculture, Bureau of Home Economics. Certain very minimum requirements are established. For every child every day, there must be one pint of milk, but the statement is added, "He should have 1½ to 2 pints." Two teaspoonfuls of cod liver oil if he is less than 2 years old are essential, but he should have 3 to 4 teaspoonfuls. One vegetable or fruit is necessary, but he should have three or four. And there should also be plenty of bread, cereals, and other energy and body-building foods.

To quote further from this bulletin:

"The food needs of growing children present the most important of all the problems to be met in planning relief budgets. Growth increases the demand not only upon the quantity of food, but also upon the quality.

\*Read before the Kentucky State Medical Association, Louisville, October 4, 1932.

Growth also hastens the ill effects of an inadequate diet. Certain specific inadequacies in diet result in deficiency diseases such as rickets, scurvy and pellagra. But the results of prolonged general underfeeding—commonly known as "general malnutrition"—while they may be less dramatic and more easily overlooked, are not less serious. In time of economic stress, children may suffer both types of damage unless the diet is carefully safeguarded. The standard of all relief should be such as to provide a fully adequate diet, which allows variety and an ample margin of safety in all the nutritive essentials, and every effort to maintain such a standard should be made even under emergency conditions."

In commenting upon the conspicuous place of milk in the dietary of the young, Professor Mary Schwartz Rose states that

"Milk owes its importance in the diet to the excellent quality of its proteins and their supplementary value for the cereal proteins; to the completeness of its assortment of mineral elements and the excellent proportions in which they occur; to the high content of calcium, which makes milk almost indispensable for ideal storage of this element during growth; to the presence of Vitamins A, B and C in quantities which make generous use of milk day by day a practical guarantee against deficiency of any of the three; and to the presence of an appreciable amount of Vitamin D in association with a calcium-phosphorous ratio very favorable to the calcification of bones and teeth."

That the average American family does not include as much milk in the dietary as the desirable standard suggested is well known. But the average per capita daily milk consumption in this country closely approaches one pint, varying considerable in different communities.

According to a report in the July 30, 1932 number of the American Medical Association Journal, the New York citizen drinks about a pint of milk a day, the citizens of Hamburg and Copenhagen about four-fifths pint, and three-fourths pint respectively, in contrast with the Parisian who drinks about one-third pint and the Berliner two-fifths pint, while in London the consumption is about midway between these last two.

Although there are doubtless a few persons who have an undeniable idiosyncrasy, usually some anaphylactic manifestation, which may preclude the use of this food in their diets, while other persons may have a "fancied dietary grievance against milk," these by no means represent the mass of the population. Hence there seems to be abundant occasion for the promotion of public health policies in urging increased milk consumption to the desirable average suggested.

#### PASTEURIZATION

Between 1860 and 1870, Louis Pasteur, of France, discovered that if beer and wine were heated to a temperature of 158° to 176° F., and kept at that temperature for a period of time, the flavor was improved and the loss from spoilage was prevented. Soon after this discovery, the heating of wines and beers became quite general in Europe, and the process was termed "pasteurization" from the name of the man who discovered it and first practiced it. Some time later, the same principle was applied to milk, in certain sections of Europe, notable Germany and Denmark.<sup>1</sup> The advantages of pasteurization are that it makes the milk safe by destroying any pathogenic bacteria that may be present, it prolongs the life of the milk by reducing the number of lactic acid organisms, and it materially reduces the total bacterial count.

While clean, fresh cow's milk is recognized as the best available form of milk for infants after they are weaned, public health workers and leading pediatricians emphasize that milk for infant and child feeding should be boiled or pasteurized as an added safeguard against communicable diseases which may be transmitted by raw milk. Boiling of milk also apparently renders the product more digestible for infants. The most commonly accepted definition of pasteurization is the following:

"Pasteurization is the process of heating milk to a temperature of approximately 145 degrees F., never lower than 142 degrees F., holding every portion of the milk at that temperature for a period of at least thirty minutes, and then promptly cooling below 50 degrees F."

In recent years, several state departments of health, on the basis of careful tests, have approved of high temperature—short time holding pasteurizers under certain restrictions similar to those recommended in a memorandum of the U. S. Public Health Service dated February, 1932.

An editorial in the April 9, 1932 Journal of the American Medical Association seems timely in this connection:

"The nutritive virtues of milk and milk products have for many years received wide acclaim in this country. There are, however, certain questions in relation to milk that many physicians are likely to have propounded to them repeatedly. The debate about the comparative values of the mammary secretion from different breeds no longer attracts attention to any considerable degree. One of the frequent queries relates to the possible choice between raw and pasteurized milks.

"In a recent monthly bulletin of the New Haven Department of Health, Mendel<sup>2</sup> of Yale has pointed out certain sanitary aspects of the problem. That raw milk may carry possibilities of harm from disease-producing



microorganisms with which it may become contaminated under current working conditions in the dairy industry is evident, he says, from record experience. It is generally admitted furthermore, that this menace may in large measure be averted by pasteurization under properly controlled conditions. The possibility of securing "safe milk" through elaborate sanitary control of the entire process of marketing milk may be admitted; but at present the necessary procedures are too elaborate and costly, says Mendel, to make certified milk or other raw milk of equal freedom from objectionable bacterial contamination available to more than a limited number of persons, even if its use were preeminently desirable. The truth of these conclusions is all the greater during a period of stress like the present when funds for food purchases are often at a low ebb in many families. One may properly ask whether the use of milk made bacteriologically safer by proper pasteurization is detrimental in other ways.

"Almost every mother has been taught that pasteurized milk, and perhaps preferable all milk, should be supplemented with some antiscorbutic, such as orange juice or tomato juice. In other respects pasteurized milk seems to possess parity with the unheated product, if we may believe the latest studies at the Ohio Agricultural Experiment Station. Comparable animals particularly sensitive to nutritive deficiencies were fed under precisely similar environmental conditions with milk from a constant source of supply. The milk furnished to one of the groups was pasteurized. The assertion that pasteurizing destroys some of the calcifying properties of milk was not substantiated. There were no differences in growth. The Ohio investigators therefore assert that, until further evidence to the contrary is available, no alarm need be felt over the nutritive value of present pasteurized milk supplies."

#### MODIFICATION

With the progress of laboratory studies, coupled with clinical experience, much knowledge has been gained regarding the modification of milk for the artificial feeding of infants. Dr. Grover Powers, in the White House Conference report, suggests that from clinical experience it seems very likely that the majority of infants thrive best on milk when it is so modified for them that between 10 to 20 per cent of the total calories are in protein, between 15 and 30 per cent in fat and between 50 and 65 per cent in carbohydrate. Budin showed that the cooking of cow's milk greatly enhanced the value of the milk in the feeding of infants. Similarly, as Dr. Powers has pointed out, investigators have fed milk which has been alkalized, acidified, peptonized, treated with colloids by the addition of starch solution or gelatine,

concentrated or dried, with a growing realization that however dissimilar some of these processes and however diverse the changes produced by them in the milk, one effect on the milk common to all is brought about such that when the milk is acted upon by rennin, the protein is precipitated in finer curds than is the case with raw milk.

#### COMPREHENSIVE MILK SUPERVISION NECESSARY

Milk and its products, butter, cream, cheese, butter-milk, skim milk, and ice cream, we may repeat, constitute the 'most important articles used for human food. The sanitary supervision of each of these products is necessary. As a city increases in size, its milk supplies tend to merge more and more until many thousands of people may be supplied from one plant which received its product from hundreds of farms widely scattered.

It is easy to understand how milk supplies, unless properly controlled, may be the vehicle of outbreaks of disease, for milk is a natural growing medium for several disease-producing bacteria. A service is, therefore, necessary for the control of milk supplies from the source of production to the point of delivery, together with an endeavor to educate the public as to the value of an adequate supply of clean, safe milk, and the necessity of proper home care of milk.

The two essential features to be considered are (1) that production of milk on the farm must be so conducted that the possibility of infection will be reduced to a minimum, and (2) that subsequent pasteurization must be so scientifically applied that any infection which does occur, despite the farm production precautions, will be prevented from reaching the consumer. The meeting of either of these requirements alone is not sufficient, for although pasteurization is the one safeguard, it is not a panacea and it cannot make of unclean milk an ideal food, nor will the most thorough going inspection of the farms prevent the occasional infection of a raw milk supply with the germs of one of the communicable diseases, or with the germs from diseased udders.

While enormous sums of money have been expended in the provision of personnel for supervision of milk supplies, and while great strides have been made in many localities in improving the quality of milk and milk products, methods and types of organization differ considerably, and there is yet much opportunity for improvement especially in the small cities and rural areas. Furthermore, many cities and counties lack adequate, trained personnel. *The extension of full-time county health units with trained personnel is perhaps the outstanding need at present.* Regardless of local provisions throughout the country, the further need for organized effort and leadership from the State is evident.

Such provision is especially important in the development and enforcement of appropriate legislation, the maintenance of trained advisory and supervisory service, and the measurement of results. Valuable assistance may also be secured from federal departments.

In spite of progress in milk supervision, a recent report made by Dr. S. J. Crumrine to the State and Provincial Health Authorities of North America shows the need for continued vigilance. For the year 1931, 19 states reported 37 milk-borne epidemics of 11 different diseases with 1,383 cases of disease and 22 deaths. During the past eight years, there were 339 epidemics, involving 14,206 cases and 449 deaths. In 1931, typhoid fever is specified as the disease involved in eighteen, or almost 49 per cent of the epidemics, while septic sore throat is second with 9 epidemics. These two diseases were responsible for 27 epidemics, 1,168 cases and all of the 22 deaths. The epidemics last year were confined to communities of less than 2,500 population. This report concludes that the reduction of personnel or the elimination of milk control measures, because of economic conditions, might be a very hazardous and costly expedient.

As recognized by Louisville, an ordinance based on and including the provisions of the state statutes should be in force, which prescribed the safeguards with which milk should be surrounded on the farm, at the pasteurization or milk plant, and during delivery. The Standard Milk Ordinance, published by the United States Public Health Service is a valuable aid to inspection for health officers and inspectors, and has been one of the most helpful devices used in recent years to promote the improvement of our milk supplies.

During the past 8 years, 444 American municipalities, located in 25 states, have adopted this program in a co-ordinated attempt to improve and to unify milk sanitation methods.

#### TRAINED INSPECTION SERVICE

Dairy farms, creameries, milk stations, ice-cream plants, and other plants handling milk products need regular careful inspections. Special consideration must be given to the methods of sterilization of bottles, cans and equipment; to the effectiveness of operation of pasteurizing machinery; to refrigeration methods; to the health of the workers; and to general cleanliness. Progress in milk control work has been noteworthy since the function of the inspector became recognized as that of an educator rather than a policeman. The operation and control of milk production and delivery requires constant vigilance on the part of trained operators and inspectors.

#### HEALTH INSURANCE BY PASTEURIZATION

Inasmuch as milk is a vital food for which there is no adequate substitute, it is imper-

ative that safe milk be at all times available for the public. Milk is also an excellent medium for bacterial growth and must, therefore, be produced and handled under the most favorable conditions of modern sanitation. Pasteurization is the most reliable safeguard at present available for practical use in communities. Realizing that the production of clean, safe milk is essential, the dairy industry is co-operating with various agencies to improve the milk supply and to safeguard further this essential food by proper pasteurization. The National Dairy Council has published a summary of the opinions of many leading scientists, physicians and welfare organizations on this subject. It is generally considered that pasteurization is not a substitute for sanitation but should be coupled with adequate supervision at the source and at the milk plant. No epidemic of disease has ever been traced to milk which was properly pasteurized and protected from contamination afterwards.

Pasteurization should be defined by law; it should be considered not as a substitute for the sanitary production of milk, but as an added safeguard. In several cities, all milk is pasteurized, and this is a wise procedure which should be increasingly adopted by cities. The committee on milk of the State and Provincial Health Authorities of North America has stated on the basis of substantial reasons that it considers dangerous to the public health any movement or policy the result of which would be to mislead the milk consumer into thinking that Grade A raw milk is more natural and therefore better for babies than Grade A pasteurized milk.

Dr. Crumrine, General Executive of the American Child Health Association, has called attention to the fact that the large cities have long recognized the protection afforded by pasteurization. "Can we permit the 25,000,000 in the small towns of the country to be without this protection? The problem of the large city is to extend the provisions of existing pasteurization requirements. The problem of the small town is to awaken its citizens to the need for the production of clean milk rendered safe by pasteurization. This requires the passage and enforcement of a proper milk control ordinance."

#### SPECIAL REQUIREMENTS

Lack of cooling or improper cooling of milk is doubtless the largest cause of high bacterial counts in milk, as it is received on the average market. Milk should be cooled as soon as it is drawn from the cow so far as possible. Public Health departments stress the importance of enforcement of temperature standards with regard to milk in transit and that held for sale, and co-operate with the producers and dealers in giving advice regarding the most practical methods of cooling and of



construction of cooling devices. Efforts should be made to have milk cooled promptly after pasteurization to a temperature of 50° F. or lower, and held at a temperature as low as this until it is delivered to the consumer. Another very important feature of supervision is the laboratory. Several practical bacteriological, chemical, and microscopic tests have been devised for use in the supervision of milk supplies. Samples of milk and milk products for laboratory examination should be collected at frequent intervals from stations, creameries, wagons and stores.

All cattle producing milk to be sold raw should be required to be tuberculin tested regularly with prompt removal of reacting animals from the herds. In several localities, it is required that all dairy cattle, whether producing milk to be sold raw or pasteurized, be regularly tested. Physical examinations should be sufficiently thorough to include efforts for the detection of mastitis. In an increasing number of areas, systemic testing of herds for brucella abortus infection is being undertaken in order to control contagious abortion and to meet the problem of undulant fever.

There are other special requirements worthy of consideration. Bottled Milk, by ordinance requirement, should be plainly marked to show the name of the producer, or distributor, the grade, and the date of production or pasteurization. All milk sold in public eating establishments should be served in the original container. The retail sale of milk, except in bottles, should be prohibited. All handlers of milk to be sold raw and all handlers of milk in the process of pasteurization and after pasteurization should be subject to a systematic and frequent medical examination, including laboratory tests which are perhaps the most important feature of the examination.

In the United States the pasteurization of milk and control of bovine tuberculosis are solving the problem of human infection with bovine strains. Large areas have been freed from this disease. There are nearly 1,000 modified accredited counties. The probable source of human infection is through raw milk from cows affected with tuberculous udders. According to Corbett the prevalence of the bovine type in cervical glands that had been removed surgically from persons 16 years of age and younger, varied considerable in different countries. In Scotland it was 87 per cent, in the United States 53 per cent, and in Germany 35 per cent.

Hasseltine recently reported 6 cases of undulant fever occurring in a town of 5,387 population, all of whom used raw milk from the same dairy, which supplied 17 per cent of the milk sold in town. Laboratory tests

of the animals in the herd revealed evidence of Brucella infection in a large number of the cows. In addition, Brucella was isolated from the milk of two of the reacting animals. No cases of undulant fever occurred in the borough after the producer and dealer began pasteurization.

#### THE SITUATION IN KENTUCKY

Where does your State stand in regard to milk supervision? Perhaps it is bold of the speaker to suggest certain possibilities. The Board of Health has been working for years to improve the milk supply, and, I understand, is advocating the principles of the Standard Milk Ordinance to the smaller communities of the State.

Mr. W. A. Dorsey, State Dairy Specialist, has been devoting the past three months to an intensive ice cream sanitation program in Central Kentucky. He has found that pasteurization of the ice cream mix certainly pays in lower bacterial counts. The average total count of samples of ice cream made from pasteurized mix was around 50,000 while that of ice cream made of raw milk products ran over 1,000,000. Mrs. Sarah Vance Dugan of the State Department of Health, in the September, 1932 bulletin of the State Board of Health, has called attention to other important provisions. Milk should be served in the original bottle and every proprietor of an "Accredited" restaurant should, if possible, serve Grade "A" Pasteurized milk. If Grade "A" pasteurized milk cannot be obtained, Grade "A" raw milk should be served. The local health officer can tell the grades of the dairies in his community. The public is urged to use Grade "A" milk.

It is also noteworthy that full-time county health units are increasing. Eighty of the 120 counties have full-time county units, and in most of them, where there is a large town, active milk control work has been inaugurated. Some 15 cities in the State have adopted the Standard Ordinance. In 19 other counties there is being produced Grade "A" milk under the supervision of full-time counties without the support of a local ordinance.

The Physicians have supported the milk supervision program and can continue to do much good in their communities in its further advancement along sound lines and in encouraging their patients to use safe milk and to give it the proper care in the home. Their support of a modern milk ordinance for the State as a whole will mean much. Is it too much to hope that the mothers in small communities where pasteurized milk is not yet available may be stimulated to the use of the simple method of home pasteurization? The medical schools have a responsibility for instructing their students on the question of milk by lectures, discussion and inspection trips. The pediatricians are in a strategic

position to spread the message widely for the benefit of their families. One county medical society includes in its informational program a monthly communication to pediatricians regarding high grade milk, its status in the county and its importance to the consumer. Somewhat similar communications are planned for the local medical societies and the hospital medical staffs of the county.

The city of Louisville has shown the way, and the intelligence with which the educational campaign with reference to the consumption of Grade "A" pasteurized milk has been conducted is praiseworthy and outstanding. This city has continued to demonstrate the interest of its community leaders in matters relating to human welfare through the institution of a comprehensive milk control campaign and the adoption of a modern milk ordinance. Since the ordinance was adopted in Louisville over a year ago, it is gratifying to note the excellent co-operation on the part of the milk dealers, milk control officials and the public in its enforcement. The assistance given to the production of a satisfactory milk supply by the Mayor's Committee deserves special mention. Milk consumption is only a little over half that of the average in cities of this size. It is noteworthy that about 96% of the supply is pasteurized. The importance of trained officials cannot be over emphasized. Louisville has been fortunate in the selection of its chief of the milk division, who occupies a recognized position in the International Association of Dairy and Milk Inspectors.

Experience indicates that educational campaigns for adequate and safe milk supplies and for adequate milk consumption bring their rewards in the promotion and preservation of public health. The active participation of the medical society, and of the individual physician in the preventive medical program of the community, which includes the milk supply, will go far in attaining the goal which Louisville has nearly reached.

#### REFERENCES

- (1) Market Milk, Kelly and Clement, John Wiley & Sons, Inc., New York, 1923.
- (2) Mendel, A. B.: The Problem of Pasteurized Milk, Health 58:3, Sept., 1931.

**Cancerous Metastasis of Bone Simulating Primary Sarcoma.**—Korkhov and Mintz state that neoplastic metastasis in the bones may often mask the primary manifestations. He describes two personal observations. In one case, an osteoclastoma of the left capula was found on roentgen examination to be secondary to a cancer of the left bronchus. In the second instance, roentgenograms proved the primary manifestation to be an ulcer carcinomatousum of the stomach with metastases in the pelvis rib, pleura and lungs.

## REMOVAL OF THE PROSTATE THROUGH THE URETHRA\*

OWSLEY GRANT, M. D., F. A. C. S.

Louisville.

Obstruction to urination by the prostate gland in the latter part of life has been recognized for a great number of years as a frequent occurrence, so frequent, indeed, that it has become an object of apprehension by a great number of men of fifty-five and over. Since its recognition, efforts to alleviate the condition have been made, the earliest ones by making a channel through the gland, the later, at the dawn of the surgical era, by removal of the obstructing part of the gland. Since, even when surrounded by the aureola of asepsis and administered by the most skilled hands, the operation of prostatectomy is attended by some considerable mortality, and a much greater morbidity, there have been constant efforts to simplify the procedure, and offer relief by a less formidable method for at least those glands that are not too large. It is the most brilliant of these efforts that we now discuss.

Since the obstruction is occasioned by changes in the gland, in some instances of an adenomatous type and in others of a fibrous type, it has become recognized that it is not necessary to remove the entire gland itself, but that removal of portions of it will insure against its recurrence in all but a minute percentage of cases. The popularity and success of the "punch operation" for over two decades attests the truth of this assertion. But the "punch operation" had many deficiencies. It was limited in its success because it could not remove sufficient tissue at a sitting, it was often attended by serious bleeding, and the inability of the operator to see at all times precisely what he was doing because the visibility of the field was poor.

When an electric current of high frequency was devised that enabled the operator to cut tissue successfully under water, and at the same time a current that would coagulate and seal the blood vessels out, a powerful instrument was put into the hands of the urologist. Now with a small loop he could cut the prostate through a field surrounded by water and through the cystoscope he could see as well and even better than through an open operation. This was the birth of transurethral resection of the prostate, and in the past three years several thousand cases have been successfully operated. Many minds and hands had a great share in its development, but our current interest is more practical than historical.

\*Read before the Kentucky State Medical Association, October, 1932, and Medico-Chirurgical Society of Louisville, May, 1932.



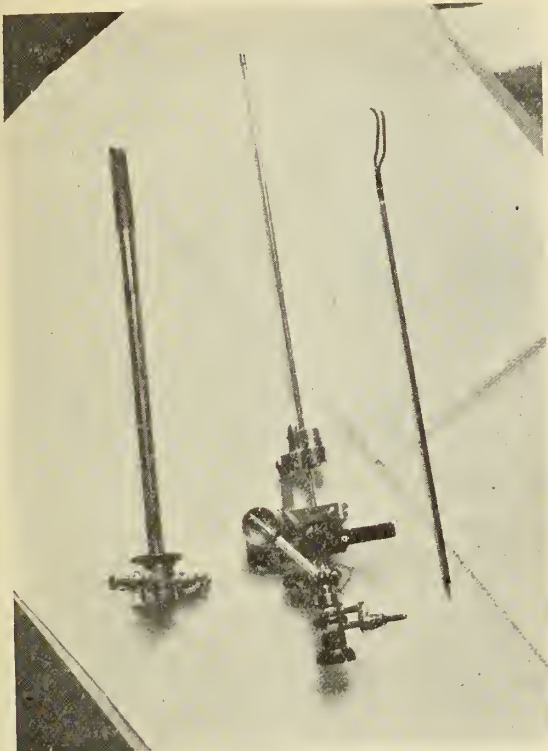


Fig. 1. McCarthy Resectoscope Unassembled.



Fig. 3. End of McCarthy Resectoscope showing cutting loop.

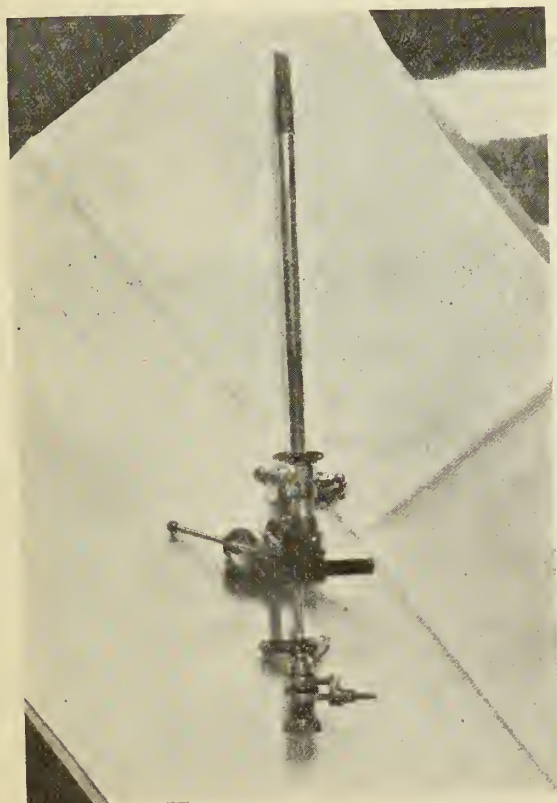


Fig. 2. McCarthy Resectoscope Assembled.



Fig. 4. X-Ray of end section showing relation of lamp and loop in sheath with Bakelite top.



Fig. 5. Mobile Bovie Unit.

To describe the operation first. The essential units are a cystoscope in a non-conducting sheath which also contains a loop of wire for the transmissal of the cutting current. Most suitable for this purpose we have found the McCarthy Resectoscope which is shown in Fig. 1 unassembled and in Fig. 2 the parts assembled for operation. Fig. 3 gives a detailed view of the cutting loop in the sheath and shows the tip of the cystoscope which yields the vision. Fig. 4 is the same shown in better detail by an x-ray photograph. The loop is attached to a ratchet and pinion gear which enables the operator to move it back and forth at will.

The generator of the high frequency current is so constructed as to have one side for a cutting current and one for a coagulating current to control hemorrhage. (Fig. 5). This is the Bovie Mobile Unit. It is attached to an ordinary wall socket and then one electrode to the patient's buttocks and the active electrode to the cutting loop at the cystoscope. By moving the current selector either cutting or coagulating current is obtained and by pressure of the foot switch the current turn-

ed on and off instantly. The instrument is introduced into the urethra and under perfect vision portions of the prostate are pared off by passing the cutting loop through it. Figs. (6 to 9). So much of the gland is removed as is deemed necessary, any bleeding points are arrested by light coagulation, a retention catheter passed into the urethra and the operation is complete. The subsequent course is irrigation of the bladder at prescribed intervals, removal of the catheter on the third or fourth day, at which time the patient should void normally.

So described this seems a very simple procedure; so enacted it is a highly technical one involving much practice and judgment. Nothing can be more misleading than the rash statements of over enthusiastic neophytes that this is a "minor operation." Because it consumes from fifteen to forty minutes, restores the patient to his bed awake and comfortable, with no blood lost and no shock, it presents a spectacular, spell binding impression on the audience. It would be easy to carve out the Venus de Milo, or the colossal statue of Michelangelo's Moses, if one knew how. The "learning how" of Resection demands first of all a good cystoscopist with manual dexterity and an operator of practical judgment in the previous handling of prostatitis.

Though this operation is applicable to over 80% of cases of prostatism who present themselves for relief, it is in no wise devised as an operation to be applied to patients who are not ordinarily fit subjects for prostatectomy. All cases submitted to this operation must (not *should* but *must*) have the same painstaking preparation as those for open operation. We must remember that securing a free channel for urination is only a part of the object of relieving the prostatic. The heart, the kidney function, the general condition have been damaged by the back pressure and absorption of urinary elements and these most vital organs must be brought to a favorable outlook before any further insult is added to the patient. Consequently preliminary drainage by catheter to restore these functions where they are impaired and acustom the urethra to instrumentation are paramount requisites. A little leeway may be allowed in those cases that after preliminary drainage never reach a state quite satisfactory for the graver operation of prostatectomy. In certain cases of this type, when prolonged drainage has shown that they have recovered their circulation and renal functions as far as they ever will recover, though this recovery be not quite so complete as we wish for, yet these patients are much better able to withstand the minor insult of some shockless urethral manipulation than the



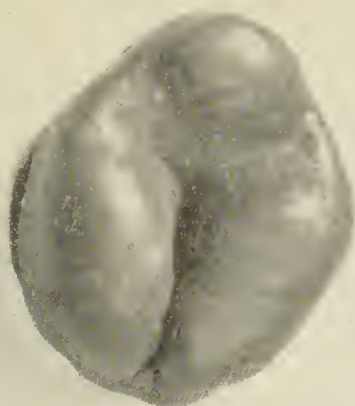


Fig. 6. Model of Trilobe Prostate from life.

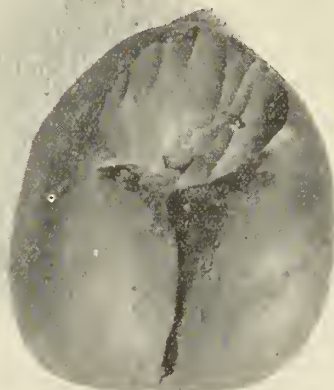


Fig. 7. Median lobe pared off by loop. (Step 1)

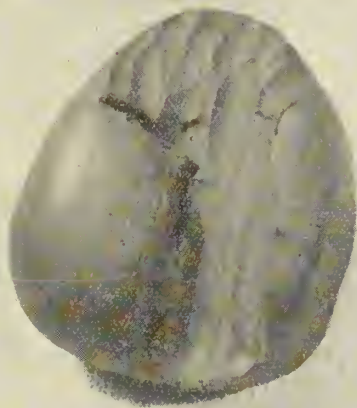


Fig. 8. Median and Left Lateral Lobes pared off. (Step 2)

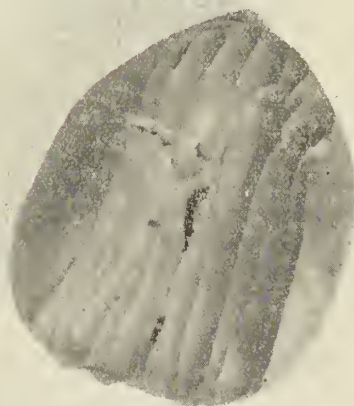


Fig. 9. Median and both laterals pared off completing channel.

graver complete enucleation of the prostate through an open wound and prolonged disagreeable drainage through a sinus. This is a matter of individual judgment.

#### WHAT TYPES OF OBSTRUCTING PROSTATE PER SE ARE AMENABLE TO THIS OPERATION?

Figs. 6, 10 and 11 present the types of the bulk of obstructing prostates, roughly 60 per cent. All these are readily operated by re-

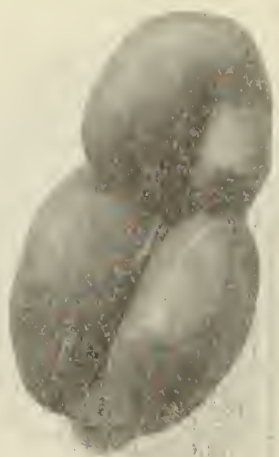


Fig. 10. Moderate Median Lobe Hypertrophy.



Fig. 11. Bilateral Hypertrophy.

section. Another twenty per cent of prostates are carcinomatous. Another ten per cent are fibrous bars and bladder neck constrictions and small subcervical glands. Granted that circulatory and renal affections are restored, only those glands which are enormously hypertrophied and extend far into the bladder, those spoken of as grades three and four in a scale of four, are better done by open operation. Since enormously hypertrophied glands constitute only about five per cent of obstructing prostates, this rules out only a small proportion. Other contraindications constituting another five or six per cent are those patients that tolerate urethral catheters poorly, highly vascular glands that do not subside and patients having deformities of the urethra that preclude successful visual-

ization of the urethra by the cystoscope

Cancer of the prostate not only does not contraindicate this operation but in fact forms one of its most valuable fields. Here a satisfactory channel may be made, affording the patient as long as he may live a natural outlet for his urine with complete control instead of a foul and disagreeable uncontrolled outlet by suprapubic catheter.

#### WHAT ARE THE DANGERS OF THE OPERATION?

It is a striking fact that all operators who have done any large series of cases, and of course these were the pioneers, were appalled by their mortality in the first twenty to forty cases. Mortality at this stage ran as high as twenty-five per cent. Then these same operators learned by experience many of the lessons which can be passed on. They banished the thought that it was a minor operation, they perceived the absolute necessity of preliminary preparation. The control of hemorrhage was in early cases a serious factor because proper currents were not available. Their subsequent series showed quite a different picture. After learning these lessons mortality dropped abruptly and now in several series of 150 cases the mortality is less than two per cent. I doubt if this will ever be much diminished considering the age and physical condition of the great majority of prostates. The danger from hemorrhage I think we may safely say has been eradicated. With the present thorough understanding proper amounts of tissue are removed and the channel left in a satisfactory condition.

#### WILL PROSTATISM OCCUR AFTER THIS OPERATION?

A twenty year experience with the punch proved that even with the small amount removed by this procedure recurrences were very rare, the prostate shrinking after the efficient drainage provided. Where we may now remove as much tissue as we desire, the likelihood of recurrence except in malignant cases seems extremely unlikely and 'three years' experience has offered that same evidence so far. Prostatism itself is not without some recurrence, and in many cases the transurethral instrument has been used to remove remaining tags or new growths after operation.

#### WHAT ARE THE ADVANTAGES OF THE OPERATION?

Much shorter hospitalization. Most patients remain postoperatively one week, only the rare one over two weeks. An agreeable convalescence with no draining sinus, no



urine soaked dressings, complete freedom of movement and a prompt resumption of their normal diet and activities. Recently we operated four of these cases one morning and on the following day, less than twenty-four hours, when we entered the hospital for rounds, all were sitting in chairs besides their beds as comfortably as the day before. This means a greatly diminished cost for nursing, dressings, and hospital room rent.

While sexual power is not a vital factor at this age, yet the libido is not decreased, in some cases patients state boastfully that it is greatly improved, and it is to be expected as especial care is taken to limit the resection to that portion of the urethra behind the vera, always sparing that structure.

#### INCONTINENCE

In none of our cases has incontinence ever occurred, nor have any of the resectionists to whom I have talked had a different experience. The residual urine should be completely eliminated. In certain cases of atonic and deformed bladders it may only be lessened but only two of our cases have had over one ounce.

That this operation has a permanent place is we think undeniable. Already two large clinics report that only ten per cent of prostates are being operated on by the open method. Considering the rapid evolution of this procedure it has been accepted by experienced urologists with more avidity and confidence than any procedure which has occurred within my memory, not even excepting intravenous urography. So brilliant are the results that they amply repay the efforts and expense of acquiring the necessary dexterity and instruments and present a gracious memorial as the gift of Urology to both the living and Posterity.

#### DISCUSSION

**W. T. Briggs**, Lexington: Mr. Chairman and Ladies and Gentlemen: I am sure you all enjoyed Dr. Grant's paper as much as I did, even though you are not as much interested in the urological side.

One thing he could not bring out on account of the shortness of time is the economic aspect, which is a great thing in large city hospitals and to all individuals who are unfortunate enough to have to have this obstruction.

Dr. Alcock last year at the urological meeting in Toronto read a paper on this same subject, and his figures show something as follows: "A bed that formerly took care of one prestatic patient is now accommodating from two and a half to three and a half patients. The saving in the cost of cotton and gauze on the urological floor for the present year is going to amount to approximately \$7200. Our bill for Pezzer catheters will be about \$600 less this year than it was before we took up prostatic resection. When

our year of resection work is up the first of August we will have taken care of about 250 prostate cases. Had the University taken care of these same cases by the old method it would have cost them, outside of the above savings, approximately \$35,000 or \$40,000 more than it is going to cost them as it is."

That is a very important phase of the question. The patient for this operation has to be prepared just exactly the same as for an enucleation. If it is a case where in enucleation you should do a two-stage operation, then you should do a two-stage operation here. When his blood chemistry and phthalein output shows that he is in good condition, you can go ahead. As Dr. Grant says, this is not a minor operation.

Eleven Los Angeles urologists, pooling their experiences with this operation in 110 cases, had a mortality of 8.2 per cent. The mortality in the first forty-one cases, many of whom were poor with large glands, was 22 per cent. The Los Angeles urologists decided that Grade 3 or 4 hypertrophies had best be handled by prostatectomy.

Dr. Davis, who is the leader in this field and has done about 400 operations, turns over his largest glands to Dr. Thompson in the same clinic. At the same time, Dr. Davis recently removed a middle lobe that weighed 50 grams, and that is a pretty big middle lobe.

Dr. Alcock, whose figures I just read to you, of Iowa City, experienced a mortality of 22 per cent for his first fifty cases, and at the meeting he showed graphically how his mortality decreased as he became more experienced.

**S. C. McCoy**, Louisville: I want to say that I not only gained by seeing Dr. Grant's presentation of his cases here, but I have also had the privilege of seeing him demonstrate practically the same thing on the living subject, which was to me a revelation. I have seen Dr. Grant do a few of these cases, and I think in his selection of cases and the cases that he operated on, the operation was marvelous.

As he has brought out here, the lack of hospitalization and the various other phases are important to the man who is considering a prostatectomy. We prostatectomists, or whatever you might classify us as, are a little slow to gather those things until we find the ultimate results.

The statistics are brought out in a very frank way to permit you to study for yourself the outcome of this operation. Dr. Young's mortality report is three per cent, and we who claim to do prostatectomies are trying to get to that point.

**C. G. Hoffman**, Louisville: Inasmuch as the mortality rate has been high, the mortality rate in anything we have done surgically in the start was very high. There are improvements on these instruments. Dr. Grant has been using the McCarthy instrument, and it is the consensus of opinion that it is the most simplified instrument. Most of these instruments were very complicated

and it took six pairs of hands to take care of them.

I think this subject is in its infancy. As we go on we will find it is just the thing to do. The original punch operation of course carried a lot of mortality with it; the field was not visualized; you didn't know what you were doing, and after you located your median bar you went in in a blind way and got a piece of it out with the electric cautery. But here you know exactly what you are doing.

I think Dr. Grant ought to have a vote of thanks for having the courage of his convictions and being the first to do it.

**Arthur T. McCormack, Louisville:** I am particularly glad that Dr. Burrow said what he did, because I think it is important as giving us an opportunity to emphasize the unity of the medical profession. A few years ago any one of us did everything. Now all of us are trying to do the same thing and we are trying to do it well. In order to do that it is just as important for the family physician who is going to refer a case to a surgeon, to make the diagnosis early enough to refer that patient when something can be done for him, as it is for the surgeon to be able to operate correctly or for the other consultant to be able to take care of the case correctly. Unless the man who first sees the case sends the patient to the man who is going to do this very interesting and very simple operation compared with many other procedures in surgery, while the patient has a chance to live and not so late that the operative risk is multiplied by a very considerable percentage, the mortality figures cannot be much improved.

The same discussion has occurred with every new procedure. Dr. Burrow and I took part more years ago than either of us would be willing to admit, in the discussion of the high mortality in the operations for appendicitis. At the beginning it was enormously high, because those of us who were seeing patients were not sending them to the surgeon early enough for him to take care of them right. We were still giving them the purgatives; we were still doing the things that we are doing with prostatic cases now. When a prostate becomes a physical enlargement to such a degree that it is an obstruction to the urinary passages, that is the time for the operation to be done and not after the patient becomes semi-moribund so that he is already infected and poisoned and in a serious condition.

The important thing for us all to learn is teamwork, that we are parts of a profession, and that the small percentage of cases, not more than ten, that are necessary to refer to others from the accurate general practitioner—the class from which Dr. Burrow comes—should be referred sufficiently early that the consulting surgeon has the opportunity to care for them in accordance with the dictates of science.

**Louis Frank:** I have been very much interested in this paper. Those of us who have followed the progress of prostatic surgery since its advent some thirty-five years ago cannot but be impressed by the tremendous advances that have been made in this line of work. Following the work of Fuller and Preyer, perhaps the greatest advance made in this field of surgery was the work done by Young in the removal of the prostate gland by the perineal route, but even with this method, which made it an operation of clean dissection, we were not able to reduce the mortality greatly in the beginning, and it is largely due to the development of physiological chemistry and studies in blood chemistry that urologists have been able to attain the degree of perfection of the present day operation, both in the mechanical removal of the prostate and in the reduction of the mortality rate. Dr. Grant touched the keynote when he intimated in his paper that the crux of the whole matter lies in the preparation of the patient. If we can get a man of the age that these patients usually are, into the shape that Dr. Grant advises for prostatic operation, he would probably be able to successfully go through any other operation.

I sent Dr. Grant a reprint of an article published within the past twelve months by Dr. Caulk, of St. Louis, in which he made the prediction that within ten years we will have abandoned all methods of operation for the enucleation of the prostate, in favor of some type of punch operation, possibly electrical rather than mechanical. I believe he is sincere in making this prediction, but whether it will be fulfilled or not remains to be seen.

An idea advanced recently is that it may be possible, by the development of an extract from the endocrine secretions of the ductless glands, to bring about reduction of enlarged prostate glands and thus obviate the necessity for any operation. Why should these enlarged glands, in some instances, become atrophied and disappear as the result of mechanical treatment, as undoubtedly happens in certain of these cases? This does not occur in true tumor growths. We do not know whether these hypertrophied glands are really glandular or tumor growths. We know that secondary growths which occur after a portion of the gland has been removed are not recurrences, but an enlargement or re-development in the portion of the gland that has been left behind.

To me the developments in the entire field of urological surgery have been very interesting, not only in respect to operative procedure but along the lines of physiological chemistry, blood studies, x-rays diagnosis and the development of electrical devices, etc.

One thing that I cannot understand is why this particular method of removal of an enlarged prostate gland should be apparently so much less dangerous to life than any other form of



removal of the gland, provided hemorrhage can be controlled. I do not see why infection would not be very apt to occur following removal of the gland by the punch operation. Possibly the secret lies in building the patient's resistance up to the point required, and the minimizing of hemorrhage and shock. Nevertheless, there is some shock consequent upon an operation of this kind, and how these patients are able to leave the hospital within five or six days, I do not understand.

**J. Garland Sherrill:** I am very glad to have heard this paper and witnessed the impressive demonstration of the instruments and methods used by Dr. Grant in this line of work.

Some forty years ago Ericsson made the statement that surgical technique would never be greatly improved. When we consider the present day methods employed in surgery of the bladder and prostate gland we know that he was decidedly wrong in this prediction.

Dr. Grant has brought our attention to a method of dealing with enlarged prostate which, if it will do all that has been claimed for it, will put a different aspect on the whole field of prostatic surgery. The majority of men, no matter how old they may be, do not look with favor upon removal of the prostate gland with its resultant loss of virility and comparatively high mortality. Therefore, a simpler manner of dealing with an enlarged prostate other than by the open method, is welcomed both by the patient and by the surgeon. If this operation is as successful as it would appear to be from the results thus far obtained, it will certainly afford a greater number of these patients an opportunity for relief from a very distressing and serious condition. It is, however, essentially an operation for the man who is skilled in the use of the cystoscope.

**Emmet F. Horine:** I wish to voice my appreciation of this excellent demonstration. It is comforting to know that individuals as markedly handicapped as most of these patients are at their age can be operated upon with such a definite degree of safety. It appears to me to greatly widen the field and permit operation in cases where other forms of operation would be contraindicated. I think urologists are to be congratulated upon the developments in this line of work.

**Henry J. Farbach:** I wish to thank the essayist and the members of this Society for the opportunity of being present and listening to this excellent paper.

Dr. Grant is to be congratulated upon the very clear manner in which he has demonstrated the technique of this operation. We are, of course, very much indebted to Young, Fuller and others for this advice in connection with preparing the patient for operation, controlling hemorrhage, etc., but I think they rather misled us in two things. First, they give the impression that when a man past fifty years of age pre-

sents an enlarged prostate, the gland will continue to enlarge and the pathology to develop until the individual is forced to operation. Second, that whenever an individual past fifty develops an enlarged prostate gland and some urinary symptoms, there is nothing for the doctor to do but to prepare the patient for operation and remove the prostate. I think all surgeons who have had considerable experience with these cases will agree with me that both premises are false. It has been my own observation that most men past fifty-five have prostatic enlargement and will go along in comparative comfort to a natural death without ever knowing they have an enlarged prostate gland unless some extraneous complication produces an exacerbation and brings the enlarged prostate to the front. This extraneous condition may be due to sexual or alcoholic excesses, acute infectious diseases, intestinal disorders, or anything that will set up an acute inflammatory process in the prostate as evidenced by pronounced urinary disturbance.

Urologists generally have come to realize that, in the past five years, too much radical surgery has been directed to the prostate. Caulk, when he made the statement several year ago that within six years his use of the open operation had shrunk from 80 per cent to less than 25 per cent by the use of his cautery punch method, opened up the field upon which this instrument has been developed.

**John M. Townsend:** I have greatly enjoyed Dr. Grant's excellent paper. It can be taken for granted, I think, that the preparation of these patients must be as thorough and careful as for suprapubic or perineal prostatectomy, but it is probably a little more pleasant for the patient because of the fact that the use of the catheter is necessary only for draining the bladder of infected urine.

A great advantage lies in the fact that these patients can be given closer postoperative attention. The results obtained from this type of operation have so far been very satisfactory, but even better results can be looked for in the hands of one who knows what complications are to be expected and what difficulties are to be encountered. Hemorrhage cannot be entirely ruled out, but Dr. Grant has demonstrated that it is comparatively easy to control. Even though, as Dr. Frank intimates, the mortality in these cases cannot be greatly reduced from that of the older methods, the shorter hospitalization period and the greater comfort of the patient makes it worth while. Under the old methods the patient was confined for six weeks or two months, while with this type of operation the average is not more than two weeks including preliminary treatment.

**John W. Price, Jr.:** I have watched the progress of prostatic surgery with keen interest for a considerable number of years and as I mentally compare the demonstration made by Dr. Grant tonight with the first prostatectomy in

which I took part, I am impressed by the tremendous progress that has been made. I want to say to Dr. Grant that if the necessity should arise for the removal of my own prostate, I would prefer this method to any that I have ever seen demonstrated. In Philadelphia, six or seven years ago, I saw a punch operation by Dr. Adams, who is a very skillful operator, and the objection I noted to that operation was that the amount of tissue that could be removed at one sitting was very small and there was considerable difficulty in controlling the hemorrhage. He also used some form of electrical current or instrument for the control of hemorrhage, but it was nothing like as efficient as that demonstrated here tonight.

Dr. Frank intimated that the danger of infection following this type of operation is as great as that in the suprapubic or perineal operations. It would appear to me that the chance of infection would be decreased rather than increased, because there is less trauma. The cases of postoperative infection that I can recall in my own experience were those in which considerable trauma had been done to the surrounding tissues. To my mind this operation would tend to minimize the amount of trauma and thus lessen the danger of infection.

I have never seen any permanent benefit following the removal of a malignant prostate gland. There is no reason for the removal of the gland if we can restore the function of the bladder and enable an individual sixty to seventy years of age to pass away without mechanical aid. In this class of cases, the smaller the amount of glands we remove, the better, and I think the operation demonstrated tonight is the one of choice because it involves far less shock than any other method.

**Owsley Grant**, (in closing): I appreciate very much the liberal discussion. There are, of course, so many things to be said that I shall not make any attempt to cover them. The only thing that I want in particular to emphasize is this question of mortality that has run along with experience. This has been a procedure in use for about four years. To quote some of the other statistics, Dr. Alcock, whom Dr. Briggs mentioned, has done almost as many of these as anybody. His mortality, as he told you, ranged about 22 per cent for the first fifty cases; I think in his last he has had some 200 ranging less than 3 per cent.

In our own particular cases we have done 68. In the first 20 my mortality was 18 per cent. In the last 40 we have lost one case.

It is simply a matter of becoming familiar with the technic, with the instrument, with the proper type of prostate which must be attacked, and realizing, as we did not realize at first, that

patients that are broken down, that are not fit for any kind of operation, even suprapubic cystoscopy, are not fit subjects for this type of surgery. They must be prepared as well as they would be for the large operation of prostatectomy, otherwise the results will be what they were in the early stages.

As I said, hemorrhage has been one of the great problems. That was the difficulty that beset us, beset Alcock, beset Davis. That has been I think absolutely controlled with in the last eighteen months.

I read in the bulletin from the Mayo Clinic only yesterday a report of, I think, 225 cases which had been done, and as far as I was able to determine there had been no deaths in the series.

This is a procedure which is going to offer relief for the great percentage of prostates, especially the early prostates. It is never going to cure the enormous intravesical prostate, in my opinion, never going to do away with prostatectomy entirely, but I do believe it is certainly the consensus of opinion of the men who have done this in any numbers in this country that it is going to relieve 80 per cent of the men.

The question of infection in the prostatic cavity and urethra is quite a fair one. Much to my own surprise there has been less infection and absorption than I at first feared and I think the explanation comparatively simple. First, we accustom all the patients to the use of a catheter prior to operation, which develops some immunity, but the important factor is that all the blood and lymph vessels in the tissue which has been cut are sealed by the same current that cuts them, and there is much less area for absorption than if the cut were made with a knife.

The most important feature in this operation, as in prostatectomy, is the proper preparation of the patient. Though some cases who had previously been sent home with suprapubic tubes in their bladder, and deemed unfit for prostatectomy have subsequently had successful resections, yet our experience has definitely been that the poorer the condition of the patient always the more complicated the convalescence. One very promising field for this operation is the prostatic who is suffering from frequency and irritation with a small residual and not enough discomfort to make him feel it justifies a prostatectomy, in a word, the early cases of moderate enlargement. With the promise of safety and success without the discomfort and distress of prostatectomy and post operative course, this operation bids fair to supplant prostatectomy wherever it is applicable.



POST OPERATIVE IRRADIATION OF  
MAMMARY CANCER\*

W. J. YOUNG, M. D.

Louisville.

In view of our lack of knowledge of the cause and origin of cancer, any remedial agent, which even produces longevity of life to the patient, must receive consideration by the medical profession.

For the past twenty-six years, x-ray has been used with varying success and has stood the test of time, not as the ideal method of attack on the cancer cell invasion, but as one having sufficient merit to warrant its continuance. During this time, improvements have been made in x-ray tubes, machines and irradiation technique until we have now replaced the leather filters with copper and aluminum; gas with Coolidge tubes, rectifying transformers by high voltage transformers and Sabourand's pastille by dosimeters for estimating the amount of rays. While the corresponding improvement in our clinical results has not kept pace with the improvements of the manufacturer, there has been a gradual improvement in technique, in the application and dosage of rays in the treatment of cancer to encourage us to greater effort.

Surgery has always occupied the foremost place in considering the attack upon mammary cancer, and rightly so. The border line between operable and inoperable cancer is not sharply drawn, but it is generally understood that as long as the surgeon feels he can extricate the entire cancerous invasion with safety to the patient the cause is operable.

The great fallacy the radiotherapist has to deal with is the concept held, both by the laity and certain others of the medical profession, that skill and judgment play no important part in the application and dosage of irradiation treatment this, of course, is not true any more than it is in surgery or any other medical specialty. Therefore, the failure of one radiotherapist should not cast condemnation upon the entire group. We have no accepted universal standard technique of irradiation and until we have, no radiotherapist should be condemned for another's failure.

The importance of post operative irradiation in cases of mammary cancer has been established by statistics and also the fact the sooner the patient can be irradiated by x-ray or radium the more certain the patient is of receiving benefit therefrom. The practice of delaying post operative irradiation until re-

currence has appeared is a pernicious one, as it is reasonable to assume some of these recurrences could have been prevented by post operative irradiation within two weeks after the surgical operation. While it is not always possible to combine the x-ray and radium treatment within two weeks after the operation the general feeling is, the sooner the treatment the better the prospect is for the patient.

The object of irradiation by x-ray or radium is to destroy cancer cells, without producing destruction to surrounding and adjacent tissues. Some of the normal cells of the body are more easily destroyed than others, such as lymphoid tissue. This is also true of cancer cells of different types, such as sarcoma and carcinoma. There is even a vast difference in the resolute and destruction of cancer cells of the same type and microscopic appearance. This is referred to in this article as "sensitivity of the cancer cell" to irradiation. It is a clinical observation that the younger the cell growth the more susceptible it is to irradiation. In past years, many authors wrote of the lethal dose of x-ray and radium irradiation to cancer cells and tumors. It has become recognized the term "lethal dose" is a relative one inasmuch as the sensitivity of cancer cells to x-ray and radium rays vary. To my mind, this reason alone calls attention to the importance of instituting post operative irradiation as the sensitivity of some cancer cells to irradiation by x-ray or radium is unusually susceptible, and beyond the venture of a doubt, good results are to be obtained in those cases where cells are responsive, although we have no means at present to distinguish and classify types most favorable for treatment. For years the radio-therapists have reported wonder cases which have made the medical profession at times skeptical. These patients undoubtedly must come under the type of cancer invasion having cancer cells of an unusual degree of susceptibility. When I first took up irradiation of cancer of the breast seventeen years ago, I was troubled by the fact some patients having cancer of similar involvement showed marked improvement when treated by x-ray or radium whether recurrent or inoperable, while in others, little or no improvement was manifested.

To this fact I now attribute the sensitivity of true cancer cells to irradiation on one hand and their resistance on the other. Until we learn to determine to estimate the sensitivity in specific cancer cells, treatment by irradiation is obviously handicapped and uncertain as to result and we are unable to select cases most favorable to irradiation.

Our most logical procedure would seem to

be to treat all post operative cases of cancer of mammary glands as soon as possible after operation, using utmost care to irradiate with doses calculated to produce best results.

There have been many articles written pro and con on the advisability of post operative irradiation, many conclusions formed by personal experiences, which, of course, is perfectly natural. There are only a few surgeons today who hold irradiation after operations on operable cancer is needless, but statistics prove longevity as well as a greater percentage of cures in those treated by surgery and irradiation combined, placing these men in the minority. As some of this same minority are prone to refer their inoperable patients to the radio-theraputists their first stand is not consistent in refusing to employ irradiation as an aid to their operative work.

We know it is impossible to palpate or detect all infected glands of the axilla and lymphatics adjacent to pathology present in the breast. Therefore, those facts also should make it imperative that the surgeon call to his aid irradiation, no matter how thorough and seemingly complete the operation. The very richness of the breast in glands and lymphatic structure and many avenues of lymphatic drainage create a problem exacting enough to require all means available to attain success, so it would be reasonable to assume post operative irradiation could well become a part of the corrective effort and not considered a possible needless measure. The two agents, at present, to best accomplish irradiation of the breast are x-ray and radium rays, or better, a combination of both. The high voltage x-ray machine is more accessible and the rays may be directed with a more even distribution over large areas with exactness and safety to the patient. In radium, we have a more powerful agent, but unless one has a prohibited amount of radium one is unable to get an even distribution treating small areas separately. In my hands, radium is more effective in the axillae, supra and infra-clavicular regions as well as nodules of the skin, whereas, over the entire breast surface employing anterior, posterior and lateral irradiation x-ray is more feasible with the high voltage x-ray machine.

The activities of the Cancer Foundation and American College of Surgeons in the establishment of clinics over the country for the purpose of rendering the public and medical profession more cancer-minded should prove beneficial and bring about earlier diagnosis. The clinical data collected in various clinics over a period of years will help us to arrive at more definite conclusions and will doubtless produce clinical evidence to help standardize the attack on the cancer cell and wage

war upon it until a more ideal method of attack is evolved.

Although the theory of preoperative irradiation of mammary cancer is sound, it has not been proven by statistics of clinical advantage, and will not be considered in this article.

The reason for this short article is not that it holds any originality of thought or new conceptions, but with a hope it may produce upon those reading it a clearer understanding of the position and purpose of those advocating post operative irradiation of the breast.

#### CONCLUSIONS

1. That post operative irradiation should become a part of every operation upon malignancy of the breast.

2. Irradiation should be given as soon as possible after operation, preferable, two weeks.

3. That our lack of knowledge of the sensitivity of the cancer cell to irradiation makes our results uncertain.

4. With the collection and compiling of clinical data present technique and clinical results should improve and make the procedure a more valuable and exacting one.

Note: The writer has purposely refrained from taking up in detail techniques of irradiation of the breast, as there is enough difference in dosage and method of application to indicate the fact there is room for improvement in standardization of treatment which must exist until more is learned of the peculiarities and characteristics of the cancer cell and its response to our efforts.

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**Interparietal Hernias.**—According to Lower and Hicken, interparietal hernia is a term used to designate a group of hernias that occur in the inguinal region between the various layers of the abdominal muscles and are classified according to the anatomic location of the hernial sac. Properitoneal hernia includes all those cases in which the hernia sac lies between the peritoneum and the transverse fascia: 119 such cases have been reported. In interstitial hernia the sac lies between the transversalis fascia and muscle, between the transversalis and internal oblique muscles, or between the two oblique muscles; 348 such hernias have been reported. In superficial hernia the sac lies between the skin and the aponeurosis of the external oblique muscle. The authors have found reports of 123 cases of this type in the literature. In interparietal hernia the sac may be monolocular or multilocular, the latter being the form present in the majority of cases. The usual clinical picture is that of intestinal obstruction. Treatment consists of early recognition and immediate relief by operation.



# Kentucky Medical Journal

Published Monthly By

THE KENTUCKY MEDICAL ASSOCIATION  
IncorporatedEntered as second class matter October 22, 1906, at  
the Postoffice at Bowling Green, Ky., under act of  
Congress, March 3, 1879.Subscription Price .....\$5.00  
Edited Under Supervision of the Council

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NEXT MEETING MURRAY

## COUNTY SOCIETY REPORTS

**Jefferson:** The following is the program for the December meeting of the Jefferson County Medical Society:

### December 5th—Essay

Removal of the Prostate through the Urethra, Illustrated by motion pictures, Owsley Grant, M.D.

Discussion to be opened by Drs. Claude G. Hoffman and Henry J. Farbach.

### Case Reports

A Case of Blastomycosis of Face and Arm, W. U. Rutledge, M. D.

Ruptured Appendix with Complications, Charles M. Edelen, M. D.

**Mason:** The Mason County Medical Society met in regular session Wednesday night October 12, 1932 at the offices of the Health Department, 215 Court Street.

In the absence of the president, the vice-president, Dr. W. G. Philips called the meeting to order with the following physicians present: C. M. McGuire, C. B. Stark, H. H. Morgan, A. O. Taylor, W. H. Cartmell, H. N. Parker, W. E. Hord, W. C. Patton, A. R. Quigley, L. H. Long, and A. F. Murphy of Maysville; M. H. Davis of Mayslick; E. J. Yelton of Germantown; and Chas. Garr and Carl Wheeler of Lexington.

Dr. Davis reported as delegate to the State meeting, telling the society that this was the largest attended State meeting that has ever been held in the State of Kentucky.

Dr. Carl Wheeler presented an extremely interesting paper on Diverticulum of the Urinary Bladder with the report of four cases that he had treated.

Dr. Taylor opened the discussion of this paper.

Dr. Garr then followed with an exceptional paper on Blastomycosis. He reported ten cases with bone involvement that he had treated at the Lexington Clinic. He outlined these with lantern slides, showing first the photograph of the skin lesions, then x-ray slides demonstrating the bone conditions. The subject was covered very thoroughly and discussed by practically every physician present.

ALLEN F. MURPHY, Secretary.

**Harlan:** The regular monthly meeting of the Harlan County Medical Society was held in Harlan August 27 at 7 p. m. The following program was carried out:

Dr. A. T. McCormack, Secretary of the Kentucky State Board of Health and Secretary of the Kentucky State Medical Association, spoke on "Community Health, The Cheapest Purchasable Necessity."

Annie Veech, Director of Child Health Welfare, gave a talk about, "Healthy Children As a Source of Wealth."

J. W. Kelly, Director of the Bureau of Public

Health Education, discussed "Health Education, An Economic Need."

HARRY LINDEN, Secretary.

**Grant:** The Grant County Medical Society met Wednesday evening, October 19 at 7:30 p. m. at the usual hour, with the following members present: Drs. A. D. Blaine, N. H. Ellis, J. D. George, W. J. Zinn, C. M. Eckler and C. A. Eckler.

In the absence of our President, Dr. J. W. Abernathy, Dr. A. D. Blaine, vice-president, took the chair and presided over the meeting. There were no communications or correspondence at this meeting.

The subject of case reports was now taken up and some very interesting and unusual experiences were given by each Doctor present and some of the very rare things which occur in medical practice were reported. This custom of ours with case reports is becoming more and more interesting at each meeting. We discussed the cases, exchanged views of treatment and the man that was not there was the loser.

Now, came our report to the State Medical Meeting, in the person of Dr. C. M. Eckler. He reported as one of the most interesting State meetings he had ever attended. He mentioned some of the most excellent papers he had heard. One by Dr. J. D. Lukens, on Malpractice and other discussions on Anesthetics, the different varieties, this he said was most interesting, another which he mentioned was the operation for Empyema in children, views as to getting proper drainage. The Study of Leprosy in Kentucky by Dr. L. H. South. He made a good report of our Society to the State meeting and reported that the next meeting would be at Murray where the Teachers College is located.

The subject for our next meeting is, "Gunshot Wounds." Discussion to be opened by Dr. J. D. George, of Cornith.

There being nothing further to call our attention we adjourned to meet again the third Wednesday in November and the usual place and hour.

C. A. ECKLER, Secretary.

**Third District:** The Third District Medical Society met with the Warren County Medical Society at the Helm Hotel, Bowling Green, on Wednesday, August 17th, 1932.

Dr. Jno. H. Blackburn reported a case of Thrombosis of the Right Brachial Vein, no immediate cause discovered. This case was discussed by Drs. Horine and W. A. Bryan.

Dr. Jno. H. Blackburn, Bowling Green, read a paper on "Micrococcus Tetragenus Septicemia Following Suppurative Appendicitis." This was discussed by Drs. W. A. Bryan and E. F. Horine.

After the luncheon, Dr. C. G. Follis, Glasgow,

read a paper on "The Cystic Ovary."

Dr. W. A. Bryan, Nashville, read a paper on "Enterospasm." This paper was discussed by Drs. C. C. Turner, Howard, Lattie Graves, G. Y. Graves, Hinton, Blackburn and Bryan.

Dr. Emmet F. Horine, Louisville read a paper on "The Problem of Hypertensive Heart Disease." This paper was discussed by Dr. B. S. Rutherford.

The next meeting will be held in Bowling Green on Wednesday, October 12th.

JNO. H. BLACKBURN, Secretary.

## NEWS ITEMS

At a recent meeting in Chicago, the directors of Alpha Omega Alpha Honary Medical Scholarship Society adopted the following resolutions in recognition of the eminent services of the late Dr. William W. Root, Slaterville Springs, New York, the founder of the society and secretary-treasurer since its organization in 1902:

1. That all stationery and official documents of the society bear the words, "Founded by William W. Root, 1902", and
2. That the annual lectures presented each year by a leading medical scientist, be known as the William W. Root Alpha Omega Alpha Lecture."

The present officers of the society are Walter L. Bierring, Des Moines, president, Austin A. Hayden, Chicago, vice-president, Josiah J. Moore, 55 East Washington Street, Chicago, secretary-treasurer. Mrs. Root will continue as assistant secretary.

In addition to the officers the directors includes Ray Lyman Wilbur, Washington, D. C., Waller S. Leathers, Nashville, Louis B. Wilson, Rochester, Minn., and Willard C. Rappleye, New York City.

The committee on extension and policy comprises Elias P. Lyon, Minneapolis, Chairman, William Pepper, Philadelphia, Irving C. Cutter, Chicago, Frederick C. White, Cleveland, and Thomas C. Routley, Toronto.

## KENTUCKY MEDICAL ASSOCIATION GOLF TOURNAMENT

The results of the golf tournament held at the Louisville Country Club on October 3 to 6 inclusive were as follows:

Twenty-four men played and six trophies were donated.

Low net was won by Dr. G. Y. Graves, Bowling Green, a silver loving cup donated by Jones Apothecary.

Second low net was won by Dr. Frank Buckner of Campbellsville. Another silver loving cup donated by the Brown Hotel.

First lucky number in blind bogey won by Dr. Hal Neal of Bowling Green, a physician's bag donated by Brooks Denhard Surgical Instrument Company.

Second lucky number in blind bogey won by



Dr. W. M. Martin, our newly elected President, a physician's bag donated by Theo. Tafel Instrument Company.

Low gross was won by Dr. A. L. Bass, Louisville, a leather golf bag, donated by the President, Dr. Philip F. Barbour.

Second low gross was won by Dr. J. Allen Kirk, Louisville, a pen and pencil set donated by Newman Drug Company.

The Golf Committee wish to take this opportunity of thanking the various firms for their liberal donations of the trophies. The golfers gave a vote of thanks to the Chairman, D. Y. Keith and his committee for the splendid arrangements for the tournament and Louisville firms for their donation of the prizes.

Dr. C. C. Little, managing director, announces that at its meeting of October 8th, the Board of Directors of the American Society for the Control of Cancer took the following action: "It was voted that the Bulletin of the Society be made its official organ and that the present relationship between the Society and the American Journal of Cancer be discontinued."

Dr. R. Alexander Bate, Jr., has moved to Suite 416 Brown Building, Louisville. Hours: 10-12, 4-5 and by appointment. Office telephone, City 174; residence telephone, Mag. 0833.

### BOOK REVIEWS

**AN EXPERIMENTAL AND CLINICAL STUDY OF PAIN IN THE PLEURA, PERICARDIUM AND PERITONEUM.** By Joseph A. Capps, M. D., Professor of Clinical Medicine, University of Chicago. With the Collaboration of George H. Coleman, M. D., Assistant Professor of Medicine, Rush Medical College. A Foreword by A. J. Carlson, M. D., Ph. D. Chairman Department of Physiology, University of Chicago. The MacMillan Company, 60 Fifth Ave., New York City, Publishers. Price, \$3.00.

This is a very valuable book for the surgeon as well as the internist and is profusely illustrated. Much of the data presented is the result of personal laboratory observations and experimentation.

**TEXT-BOOK OF CLINICAL NEUROLOGY:** By Israel S. Wechsler, M. D., Professor of Clinical Neurology, Columbia University, New York; Attending Neurologist, Neurological Institute and The Montefiore Hospital, New York City. Second Edition, Revised. 759 pages with 142 illustrations. Philadelphia and London: W. B. Saunders Company, 1931. Cloth \$7.00 net.

This new edition gives you all the new developments in clinical neurology. Prominent among the added features is the new ma-

terial on encephalography, on the pathology of tumors of the brain, and on the epilepsies. Several important neurologic syndromes have been added; usage has suggested several helpful rearrangements of subjects; new illustrations have given further clarity to difficult subjects. Dr. Wechsler has made this edition of his book a richer factual guide to neurology. More strongly than ever he emphasizes the practical, clinical aspects of neurology. It is a bedside neurology—different in approach and arrangement.

**STENOGRAPHIC REPORTS OF THE CLINICS OF JOHN F. ERDMANN, M. D., F. A. C. S.,** Professor of Surgery in Columbia University; Executive Officer in the Department of Surgery, New York Post-Graduate Medical School; Director of the Department of Surgery, New York Post-Graduate Hospital. Edited by J. William Hinton, M. D., F. A. C. S., Associate Professor of Surgery, New York Post-Graduate Medical School (Columbia University); Associate Visiting Surgeon to Bellevue Hospital, New York City. 315 pages with 39 illustrations. Philadelphia and London: W. B. Saunders Company, 1932. Cloth, \$4.50 net.

This new book is a collection of the series of lectures given by Dr. John F. Erdmann before postgraduate students at the New York Postgraduate Medical School. These lectures, through the efforts of Dr. J. William Hinton, were taken down in shorthand. Into this stenographic report are woven the observations and experience of Dr. Erdmann's forty years' activity in surgical fields.

These lectures cover virtually the entire range of surgery, and include preoperative and postoperative care, appendicitis, gall-bladder conditions, diseases of the pancreas, liver, stomach, duodenum, intestines, rectum, anus, urinary bladder, female sexual organs, thorax, throat, spleen, even to a stab wound of the heart and dislocation of the thumb.

This is the most practical record of the diagnosis and treatment of surgical conditions that has appeared in the English language for many years. Dr. Erdmann is not only a keen diagnostician and a skilful operator, possesses that rare faculty of being able to impart to others the rich clinical knowledge which he has stored up in his mind during long years of active surgical practice with a wealth of clinical material.

**DIAGNOSIS AND TREATMENT OF THE THYROID GLAND.**—By George Crile and Associates. 508 pages with 164 illustrations. Philadelphia and London: W. B. Saunders Company, 1932. Cloth, \$6.50 net.

The medical world has been awaiting this work on the Thyroid by Dr. George Crile

and his Associates. It is a complete presentation of today's knowledge—medical treatment and management; iodine in prophylaxis and treatment; surgery, with exact technic, illustrated; x-ray and radium; and a full discussion of all important related disturbances. Under this latter division are included the blood, heart disease of children, pulmonary tuberculosis, laryngeal disturbances, skin diseases, eye, metabolic disturbances, joint conditions, and syphilis. Set down here for you are the special points in technic developed by Dr. Crile and his Associates, and many valuable suggestions—growing out of wide experience. After the presentation of the surgical technic is a resume of the end-results in 22,441 operations and a discussion of the specific findings in the follow-up of patients. This is one of the most important books of the year and is a record based on a great wealth of clinical material. It tells you exactly how to diagnose—how to be reasonably sure of your diagnosis; how to prevent thyroid troubles, and how to treat them.

**PRACTICAL OBSTETRICS FOR STUDENTS AND PRACTITIONERS.** By P. Brooke Bland, M. D., Professor of Obstetrics, Jefferson Medical College, Chief Obstetrician, Jefferson Medical College Hospital, Philadelphia, Assisted by Thaddeus L. Montgomery, M. D., Associate in Obstetrics Jefferson Medical College, Philadelphia. Illustrated with 519 engravings including 21 colored plates. F. A. Davis Company, Publishers. Price \$8.00.

This book had its origin in a series of obstetric tables prepared for and used by our students in their clinical and laboratory work. In construction it is fashioned after the standard textbooks on obstetrics, although it is compiled with the object of having it fill an important place between the large work and the small manual.

The author has endeavored to provide the student with a concise textbook, the practitioner with a dependable guide and the specialist with an exposition of our personal views on current obstetric problems. In this volume will be found certain theoretical considerations which are regarded as modern and rational, as for instance the newer concepts of obstetric physiology, the most recent views respecting the various phases of pregnancy toxemia, as well as the etiology, pathology and therapy of puerperal infection. Symptoms are classified according to their general and local manifestations.

Special points in differential diagnosis are tabulated. Discussion is devoted to all types of treatment of accepted worth. Special emphasis is placed on those methods which we

not only regard of value, but which we personally advocate and practice.

**THE FAILING HEART OF MIDDLE LIFE, THE MYOCARDIOSIS SYNDROME, CORONARY THROMBOSIS, AND ANGINA PECTORIS.** By Albert S. Hyman, A. B., M. D., F. A. C. P., Cardiologist Beth Davis and Manhattan General Hospital, Attending Physician and Cardiologist Hospital for Aged, and Aaron E. Parsonnett, M. D., C. M. F. A. C. P., Attending Physician and Cardiologist Newark Beth Israel Hospital with preface by David Riesman, M. D., Sc. D., F. A. C. P., Professor of Clinical Medicine, University of Pennsylvania School of Medicine, Philadelphia, Penn., with 166 illustrations. Some in color. F. A. Davis Company, Publishers, Price, \$5.00.

The growing menace from cardiac disease in the prime of life makes it especially important that the family physician should know the signs and symptoms of these middle life forms of heart disease that often do not manifest themselves by clear cut physical signs. This volume meets this need for the authors have given a clear cut picture of the most important groups of cardiac diseases and in such a way that it can be easily understood and comprehended.

**THE SURGICAL CLINICS OF NORTH AMERICA.** (Issued serially, one number every other month). Volume 12, No. 4. (Mayo Clinic Number—August, 1932) Octavo of 227 pages with 79 illustrations. Per clinic year, February, 1932 to December, 1932. Paper, \$12.00; Cloth, \$16.00 net. Philadelphia and London: W. B. Saunders Company, 1932.

**THE SURGICAL CLINICS OF NORTH AMERICA.** (Issued serially, one number every other month.) Volume 12, No. 5. (Chicago Number—October, 1932). Octavo of 268 pages with 61 illustrations. Per clinic year, February, 1932 to December, 1932. Paper, \$12.00; Cloth, \$16.00 net. Philadelphia and London; W. B. Saunders Company, 1932.

The Surgical Clinics of North America bring you clinical instruction—post-graduate work with America's leading surgeons as instructors. In this new series the subscriber gets the clinical work of leading surgeons, operating and teaching at the large hospitals of America's principal surgical centers—Philadelphia, New York, Chicago, Boston, The Mayo Clinic, San Francisco, St. Louis, the South, and other surgical centers. The Clinics give you the experience of the country's great teacher surgeons, their methods and technic.



# KENTUCKY MEDICAL JOURNAL

PUBLISHED MONTHLY

BY THE

KENTUCKY STATE MEDICAL ASSOCIATION  
INCORPORATED

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EDITED BY

ARTHUR T. McCORMACK, M. D., A. B., DR. P. H.

UNDER THE SUPERVISION OF THE COUNCIL

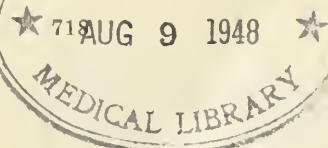
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VOLUME XXX

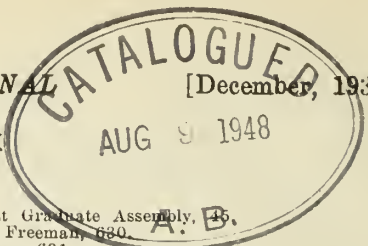
JANUARY TO DECEMBER, INCLUSIVE, 1932

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LOUISVILLE, KENTUCKY  
1932



INDEX TO VOLUME XXX  
Compiled by L. H. South, M. D.



ORIGINAL ARTICLES

A.

- Acute Lead Poisoning In An Infant, 402.
- Acute Mastoiditis, When To Advise Medical Treatment, 23.
- Acute Nephritis, 475.
- Aerophagia or Gastric Pneumatosis, 385.
- Agranulocytic Angina, Report of Three Cases, 417.
- Agranulocytosis, Report of Two Cases, 616.
- Amidopyrine Analgesia, 272.

B.

- Benign Hydatid or Vesicula Mole, 84.
- Bleeding From the Rectum, 608.
- Blindness Following Measles, 275.
- Bohler Method In Treatment of Fractures, 506.
- Bright's Disease, 111.
- Broncho-Pneumonia, 329.

C.

- Calcification In Pulmonary Tuberculosis, 344.
- Cancer of Upper Respiratory Tract, 13.
- Carcinoma of Cervix Impending Labor, 277.
- Case of Multiple Intussusception, 406.
- Case of Dermatitis Caused by Butesin Picrate, 516.
- Case of Oculoglandular Tularemia, 137.
- Catheterization Versus Myringotomy In Persistent Otitis Media, 428.
- Certain Problems In Treatment of Fractures, 183.
- Challenge to the Medical Profession, 40.
- Chorea, Interesting Case of, 291.
- Cholecystectomy, 322.
- Chronic Hypochromic Anemia, 590.
- Chronic Meningococci Meningitis, 83.
- Clinical Aspects of Tumors of Jaw and Palate, 440.
- Clinical and Surgical Aspects of Acute Intestinal Obstruction, 242.
- Clinical and Surgical Aspects of Diseases of Stomach, 52.
- Clinical and Surgical Aspects of Diseases of Biliary Tract, 47.
- Clinical Types of Nephritis, 115.
- Clinical Study of Pyrelotheraphy, 593.
- Complications of Lobar Pneumonia, 569.
- Contraception, A Review of Indications and Technic, 253.
- Criteria For Diagnosis of Cardiac Diseases, 197.
- Cross Cylinders As An Aid In Refraction, 24.

D.

- Development of Good Citizenship, 575.
- Diagnosis of Latent Syphilis, 72.
- Diagnosis of Duodenal Ulcer, 398.
- Diagnosis of Bladder Neoplasms, 72.
- Diagnosis and Treatment of Borderline Hyperthyroidism, 623.
- Dietetic Principles, 127.
- Difficulties In Diagnosis of Empyema and Surgical Consideration, 172.
- Doctor Looks at Medical Service in Kentucky, 2.
- Does Antirabies Serum Prevent Rabies, 478.

E.

- Ear In Acute Infectious Diseases, 490.
- Eclampsia, A Preventable Disease, 257.
- Effect of Disease Upon Calcium Content of the Blood, 204.
- Epiloptic Problem, 584.
- Etiology In the Diagnosis of Heart Disease, 179.
- Etiology of Middle Ear Suppuration With Special Reference to Sinusitis, 436.
- Etiology and Diagnosis of Intracranial Complications of Diseases of Ear and Mastoid, 494.
- Evaluation of Some Newer Methods In Treatment Lobar Pneumonia, 563.

EDITORIALS

- American Association For Study of Goiter, 102.
- American Medical Golfers, 238.
- Annual Meeting, 525.
- A New Year, 1.
- Arrangements For Louisville Meeting, 467.
- At The Club, 362.
- Be Safe From Tularemia, 632.
- Certificates For Barbers and Beauticians, 467.
- Congratulations On Twenty-fifth Anniversary, 629.
- County Society Meeting, 303.
- Course In Public Health, 304.
- Courage, 362.
- Cross-Eyed Child, 413.
- Eye, Ear, Nose and Throat Section, 411.
- First Kentucky White House Conference, 526.
- Fly to New Orleans, 238.
- Golf Tournament '37, 328.
- Good Work Well Done, 527.
- Have You Paid Your Dues, 168.
- Hickman County, 580.
- Howard A. Kelly, 468, 525.
- Honor to Kentucky Health Officers, 527.
- Hygeia, 2.
- International Medical Assembly, 467.
- Kentucky at the Southern Medical, 45.
- Kentucky White House Conference, 631.
- Key to White House Conference, 303.
- League of Christian Physicians, 580.
- Louisville Diagnostic Cancer Clinic, 101.
- Louisville Session, 579.
- McCracken County Leads, 631.

- Mid South Post Graduate Assembly, 45.
- Mrs. Walter J. Freeman, 630.
- New Bacteriology, 631.
- New Norton Memorial Infirmary, 103.
- New Orleans Session of the A. M. A., 257.
- Next Annual Meeting, 237.
- Ophthalmic Examination, 102.
- Our Advertisers and Exhibitors, 361.
- Post Graduate Obstetrical Lectures, 526.
- Post Graduate Course, 304, 239, 237, 168.
- Preliminary Program, 303, 361, 444.
- Prevention and Cure of Pellagra, 412.
- Public Address, 362.
- Robert Koch, 168.
- Sinton Treatment of Malaria, 46.
- St. Joseph's Infirmary Cancer Clinic, 411.
- Southern Surgical Congress, 102.
- Southeastern Surgical Congress, 580.
- Summer Round Up, 630.
- Typhoid Vaccination, 629.
- Verdict of Experience, 101.
- What the Public Should Know About Childbirth, 167.
- Wassermann at State Laboratory, 579.
- Woman's Auxiliary, 1.

F.

- Fatal Hemorrhage Following Erosion of Internal Carotid Artery, 619.
- Fracture Into and Near Ankle Joint, 407.
- Full Time County Health Department and Its Relation to Medical Profession, 453.

G.

- Gastro Intestinal and Biliary Treatment Symposium, 47.
- General Management of Diabetes, 129.

H.

- Hay Fever, Diagnosis and Treatment, 29.
- Head Colds, 261.
- Health, Its Value to You As An Investment, 95.
- Heart Condition, 314.
- Hyperthyroidism, 387.

I.

- Importance of Recognition of Early Carcinoma With Some Remarks On Treatment, 458.
- Injections of Hemorrhoids, 59.
- Interstitial Nephritis, 96.
- Interlobular Pleurisy, 295.
- Intravenous Urography, 122.
- Intravascular Complications In Surgery of the Pulmonary System, 219.
- Intussusception In a Child 4 Months Old, 271.

L.

- Lead Poisoning, 274.
- Local Temperature Studies In Diseases of Ear, Nose and Throat, 445.
- Lung Abscesses, 85.

M.

- Malaria, 455.
- Malnutrition, An Improved Method of Treatment, 606.
- Management of Carcinoma of Breast, 356.
- Management of Heterophobia, 37.
- Mastoiditis From Standpoint of General Practitioner, 491.
- Mechanism and Treatment of Heart Failure, 509.
- Medical Association and the Milk Supply, 697.
- Minutes of Eye, Ear, Nose and Throat Section, 10.
- Minutes of 82nd Annual Scientific Session, 633.
- Minutes of House of Delegates, 641.
- Modern Conception and Treatment of Comitant Strabismus, 419.

Memoriam:

- J. T. Bolderick, 523.
- O. H. Shively, 523.

N.

- Neoplasms of the Kidney, 110.
- Neurological Surgery of Bladder Neoplasms, 379.
- Non Parasitic Hepatic Abscesses, 480.

O.

- Occasional Operator, 405.
- Ocular Manifestation of Systemic Diseases, 161.
- Operative Risk In Heart Disease, 197.
- Oration In Medicine, 590.
- Oration In Surgery, 584.
- Osteomyelitis Complicating Frontal Sinus, 20.

OFFICIAL ANNOUNCEMENTS

- Auditors Report, 541.
- Constitution and By-Laws, 530.
- Louisville Committee For State Meeting, 469.
- Minutes of 82nd Session, 633.
- Official Call, 530.
- Preliminary Program 308, 414, 470, 528.
- Proceedings of Eye, Ear Section, 415.
- Report of Business Manager, 540.

P.

- Paget's Disease of Breast, 278.
- Pathology of Latent Syphilis, 70.
- Pathology of Rabies, 288.
- Pathology and Physiology of Chronic Cholecystitis As a Basis for Diagnosis and Treatment, 308.
- Pediatrics and Pediatricians, 694.
- Perthes' Disease, 281.
- Phytobezoar, 79.



Physician and Public Health Work, 399.  
 Post Operative Irradiation of Mammary Cancer, 711.  
 Post Operative Paralytic Ileus With Recovery, 394.  
 Present Status of Agranulocytosis, 318.  
 Present Status of Hemolysis In Blood Transfusion, 526.  
 Premature and Immature Infants, 551.  
 Prevalence of Morax-Axenfeld Conjunctivitis, 451.  
 Pre and Post Operative Treatment In Abdominal Surgery, 187.  
 Proper Use and Selection of Diuretics, 143.  
 Prophylaxis and Treatment of Chronic Nephritis, 350.  
 Privilege To Serve, ---.

## R.

Rabies, 286.  
 Reasons Why Thyroidectomy Should Not Be Postponed, 249.  
 Recent Advances In Ireanesthetic Medication, 152.  
 Rectal Pain, 514.  
 Relationship Between The Doctor, The Surgeon and The Patient, 145.  
 Removal of Prostate Through Urethra, 702.  
 Retropharyngeal Abscess In a Child With Autopsy Findings, 621.  
 Report of Three Cases of Gastro Intestinal Hemorrhage, 269.  
 Review of University Kentucky Bulletin Studies in Medical Service, 332.  
 Roentgen Diagnosis of Empyema, 172.  
 Rupture of Rectus Abdominis Muscle, 230.

## S.

Scarlet Fever Observations On Control In Harrison County, 471.  
 Shall We Continue to Perpetuate Feeble Mindedness, 354.  
 So-Called Modern Urinary Antiseptics, 67.  
 Some Points In the Treatment of Fractures of the Extremities, 265.  
 Some Professional Problems, 338.  
 Some Observations On Treatment of Interstitial Keratitis, 423.  
 Sterilization For Human Betterment, 518.  
 Study of Arterioles In Hypertensive Heart Disease Without Hypertension, 610.  
 Surgical Aspect of Diabetes, 132.  
 Surgical Treatment of Empyema, 174.  
 Surgery of Common Duct, 280.  
 Suboccipital Decompression In Treatment of Brain Lesions, 613.  
 Study of Some Phases of Dyspnoea, 64.  
 Symposium on Lobar Pneumonia, 559.  
 Symposium In Diseases of Ear and Some Complications, 490.  
 Symposium Neoplasms of Urinary Bladder, 375.  
 Symposium On Intravascular Surgical Complications, 210.  
 Symposium On Empyema, 169.  
 Symposium On Latent Syphilis, 70.  
 Symposium On Diseases of the Kidney, 110.  
 Symposium of Chronic Epidemic Encephalitis, 139.

## SCIENTIFIC EDITORIALS

But Children Need Mothers, 307.  
 Diabetic Coma, 241.  
 Metalized Milk For Anemia, 241.  
 Ocular Exercises, 468.  
 Oxygen Therapy In Treatment of Pneumonia, 581.  
 Treatment of Pneumonia, 632.

## T.

Thrombosis of Latent Syphilis, 74.  
 Three Different Kinds of Tumors In Same Pelvis, 390.  
 Thermo Puncture of Detached Retina, 431.  
 Therapeutic of Digitales, 512.  
 Tortion of a Normal Ovary and Tube, 232.  
 Trichinosis, Report of a Case, 272.  
 Treatment of Diabetic Coma, 131.  
 Treatment of Latent Syphilis, 74.  
 Treatment of Heart Disease, 199.  
 Treatment of Brain Abscess, 371.  
 Treatment of Bladder Neoplasms, 379.  
 Treatment of Congenital Syphilis With Bismuth Arspenamine Sulphonate, 404.  
 Treatment of Intracranial Complications Following Ear and Mastoid Infection, 498.  
 Tularemia, 323.  
 Tubal Twin Pregnancy, 606.

## U.

Unusual General Condition With First Symptoms Appearing In the Eve, 17.  
 Unusual Fractures, 293.  
 Unusual Urinary Obstruction With Case Report, 337.  
 United and Delayed Union of Fracture, 363.

## W.

Was It An Error In Diagnosis, 226.  
 What General Practitioner Should Know About Goiter, 462.  
 Whooping Cough With Unusual High Leucocyte Count, 92.  
 Why A Doctor, 584.

## X.

X-Ray In Diagnosis of Cardiac Disease, 196.  
 X-Ray In Diagnosis of Lobar Pneumonia, 571.

## BOOK REVIEWS

Annual Report Of Council on Pharmacv, Etc., 43.  
 Bio Chemistry In Internal Medicine, 300.  
 Court and Doctors, 236.  
 Diagnosis and Treatment of Thyroid Gland, 715.  
 Diseases of Skin, 41.

Expectant Mother's Handbook, 524.  
 Experimental and Clinical Study of Pain in Pleura, 715.  
 Failing Heart of Middle Life, 716.  
 Gonorrhea In Male and Female, 164.  
 Gynecology and Urology For Nurses, 236.  
 Intestinal Toxemia, 164.  
 Manual of Clinical and Laboratory Technic, 524.  
 Modern General Anesthesia, 521.  
 Mayo Clinic Papers, 41.  
 New and Non Official Remedies, 42.  
 Nurses Medical Lexicon, 233.  
 Physical Diagnosis, 41.  
 Practical Obstetrics for Students and Practitioners, 716.  
 School Nursing, 233.  
 Stenographic Reports of Clinics of John Erdmann, 715.  
 Surgical Errors, 300.  
 Surgical Clinics of North America, 521, 524, 164, 43, 716.  
 Simplified Diabetic Management, 42.  
 Text Book Orthopedic Surgery, 41.  
 Text Book Human Embryology, 41.  
 Text Book of Histology, 236.  
 Text Book of Clinical Neurology, 715.  
 United States Army X-Ray Manual, 521.  
 Varicose Veins, 521.  
 White House Conference, 360.

## COUNTY SOCIETY REPORTS

Bourbon, 98, 166, 234, 301, 359, 464, 522.  
 Bullitt, 165.  
 Clay, 98.  
 Dry Ridge, 522.  
 Fifth District, 465.  
 Franklin, 99, 165, 234, 235, 301, 465, 627.  
 Grant, 360, 577, 44, 99, 235, 465, 714.  
 Greenup, 166.  
 Harlan, 578, 713.  
 Harrison, 359.  
 Hopkins, 166.  
 Jefferson, 44, 98, 166, 234, 301, 410, 627, 713.  
 Letcher, 166.  
 Licking Valley, 100.  
 Mason, 302, 410, 713.  
 McCracken, 99.  
 Muhlenburg, 235.  
 Nelson, 628.  
 Perry, 235.  
 Scott, 360.  
 Seventh District, 627.  
 Third District, 464, 523, 714.  
 Wayne, 235.

## CONTRIBUTORS

## A.

Abell, Irvin, 54, 96, 148, 187, 284.  
 Allen, E. S., 93, 283.  
 Allen, J. D., 393.  
 Alley, R. C., 514, 608.  
 Altman, G. G., 139, 248.  
 Amerson, S. S., 360.  
 Andrews, H. S., 551.  
 Anderson, J. L., 99.  
 Armstrong, R. M., 31.  
 Arnold, I. A., 369.  
 Atkinson, W. B., 405.  
 Aud, G. F., 98, 229, 301, 489.

## B.

Baker, M. C., 32, 89, 427.  
 Ball, Robt. P., 52, 286, 471.  
 Barbour, P. F., 168, 362, 96, 581.  
 Baron, Charles, 233, 326, 406.  
 Barkley, A. H., 64.  
 Bass, A. L., 20, 32, 430, 436, 490, 504.  
 Bate, J. T., 377.  
 Beard, M. F., 610.  
 Beck, C. K., 17.  
 Bell, Austin, 338.  
 Bell, J. C., 44.  
 Blackburn, J. H., 191, 242, 464.  
 Blades, J. M., 323.  
 Bledsoe, R. W., 444.  
 Blythe, Vernon, 172, 179.  
 Boggess, W. F., 569.  
 Bolderick, J. T., 523.  
 Bowen, J. A., 379.  
 Bradley, E. B., 175.  
 Breckinridge, S. D., 253.  
 Brennan, J. A. O., 269.  
 Briggs, W. T., 127, 707.  
 Bruce, J. W., 271, 402, 557.  
 Bullock, W. O., 55, 248.  
 Buttermore, H. K., 578.

## C.

Caldwell, J. H., 57, 193.  
 Casper, M., 58, 160, 368.  
 Caudell, F. W., 236.  
 Carroll, Owen, 466.  
 Clark, H. C., 423.  
 Cohen, A. E., 129, 290, 619.  
 Collins, E. D., 166.  
 Coleman, J. A., 455.  
 Connor, R. W., 332.  
 Cowley, R. H., 24, 423.

## D.

Dabney, S. G., 275, 500.  
 Davis, R. H., 301.

Davis, W. T., 419, 452.  
 Davidson, H. A., 256, 461.  
 Dean, Walter., 431, 439, 449, 491, 504.  
 Donnelley, A. D., 506.  
 Dowden, C. W., 115.  
 Dowdall, W. T., 348.  
 Doyle, G. F., 137.  
 Drake, W. P., 13, 426, 444.  
 Dugan, W. C., 283.  
 Dulaney, Octavus, 427, 430, 439, 562.  
 Dyers, Garland, 143.

## E.

Eckler, C. A., 44, 100, 302, 578.  
 Edwards, El. V., 29.  
 Ellis, J. B., 358.  
 Emrich, W. H., 394.  
 Enfield, C. D., 210, 356.  
 Evans, Raymond, 488.

## F.

Flanary, M. D., 183.  
 Flexner, Morris, 93, 208, 230, 298, 318.  
 Frazier, Harry, 275.  
 Frank, Louis, 708.  
 Frank, Wallace, 56, 85, 231, 219, 278.  
 Frankel, S. C., 199, 293.  
 Frehling, J. M., 347.  
 Fugate, I. T., 347.

## G.

Gailbreath, Hays, 134.  
 Gardner, W. E., 141, 276, 292, 209, 504.  
 Garr, C. C., 185.  
 Garred, M. D., 389.  
 Garon, M. L., 558.  
 Garrison, S. P., 606.  
 Gaupin, C. E., 74.  
 Gernert, E. R., 298.  
 Gingles, H. W., 314.  
 Glaboff, J. J., 403, 503, 558.  
 Goldberg, Harry, 225.  
 Grant, Owsley, 381.  
 Graves, G. Y., 308.  
 Graves, Latta, 350.  
 Griffith, D. M., 22, 427, 430.  
 Greenwell, R. H., 628.

## H.

Hall, G. C., 22, 88, 270, 438, 451, 494.  
 Hancock, J. D., 136, 480.  
 Hancock, Jethra, 69.  
 Harding, D. B., 176.  
 Hendon, G. A., 186, 270, 285, 294, 368.  
 Henry, M. J., 132, 486.  
 Herman, H. C., 403, 504.  
 Hiscock, I. V., 697.  
 Hoffman, C. G., 67, 707.  
 Horine, E. F., 183, 222, 610, 709.  
 Hume, W. I., 177.  
 Hurst, A. T., 131.

## J.

Jacob, Leo, 161.  
 Jelsma, Franklin, 80, 374, 498, 615.  
 Johnson, C. B., 166.  
 Johnson, Sidney, 227, 278, 396, 571.  
 Johnson, W. E., 251, 255, 623.  
 Joyner, W. H., 329.  
 Jones, D. L., 399.  
 Judd, E. Starr, 125.

## K.

Kavanaugh, C. N., 590.  
 Keith, D. Y., 383, 461, 615.  
 Kelley, R. L., 516.  
 Kelley, Howard, A., 468, 525.  
 King, J. E. J., 371.  
 Kinnaird, Virgil, 627.  
 Kinsman, J. M., 275, 559.

## L.

Leavell, H. R., 563.  
 Limper, Margaret, 551.  
 Loftus, M. E., 475.  
 Logan, Leslie, 322.  
 Lucas, C. G., 226.  
 Lyons, A. M., 518.

## M.

Mahaffey, Herman, 393.  
 Marks, S. B., 23, 31, 90, 429, 449.  
 Marks, T. M., 404.  
 Massie, F. M., 47.  
 Mason, W. H., 59.  
 Maxwell, E. S., 111.  
 Miller, A. J., 70, 223, 288, 393, 451.  
 Miller, O. O., 177, 192, 295, 344.  
 Miller, O. R., 231, 407.  
 Mitchell, E. W., 512.  
 Molloy, L. P., 426, 23.  
 Moore, W. B., 359.  
 Moore, J. W., 298.  
 Moren, J. J., 139, 276, 292.  
 Morrison, J. R., 297, 572.  
 Morse, J. L., 694.  
 Murphy, A. F., 410.  
 McCarty, A. C., 224, 575.

McCormack, A. T., 149, 708.  
 McCoy, S. C., 126, 337, 707.  
 McConnell, W. T., 558.  
 McLean, H. L., 150.  
 McNeill, Clyde, 297.

## N.

Newell, Quitman, U., 458.  
 Nicholson, W. W., 92.  
 Nickell, A. W., 202.  
 Norfleet, Carl, 84.  
 Northcutt, E. W., 265.  
 Nuckols, O. P., 179.

## O.

Offutt, W. N., 417.  
 Orsborn, Roy, 235.  
 Osborn, H. C., 387.  
 Overstreet, S. A., 403.  
 Owen, B. W., 185, 368.

## P.

Palmer, E. R., 77.  
 Palmer, Martin, 396.  
 Pfingst, A. O., 18, 425, 435.  
 Pickett, Alice N., 558.  
 Pope, Curran, 593.  
 Price, J. W., 272, 709.  
 Pritchett, J. H., 291, 556.  
 Pryor, W. R., 501.

## R.

Ray, E. H., 122, 127.  
 Ray, T. J., 247.  
 Reddick, J. T., 99.  
 Reynolds, H. G., 426, 449.  
 Richey, H. E., 152.  
 Ridgway, S. H., 165.  
 Robinson, G. C., 509.  
 Roberts, H. H., 261, 360.  
 Robins, Vernon, 289.  
 Rothert, F. C., 307.  
 Rubel, H. M., 254.  
 Rutledge, B. S., 61.  
 Rutledge, W. U., 517.

## S.

Salmon, D. L., 166.  
 Scott, J. W., 143, 147, 178.  
 Shapero, A. A., 385.  
 Shaw, C. W., 100.  
 Sherrill, J. G., 95, 210, 277, 279, 390, 575, 487, 622.  
 Shively, O. H., 523.  
 Simpson, V. E., 2, 56, 124, 201, 573, 182.  
 Smith, T. Cook, 290, 347, 551.  
 Smith, R. E., 478.  
 Smith, L. E., 40.  
 Smith, S. C., 66, 246.  
 Smith, U. H., 98, 410.  
 Sneed, William, 363.  
 Solomon, L. L., 91, 290, 293, 559, 517, 612.  
 Speidel, Edward, 256, 257, 461.  
 Speidel, F. G., 127.  
 Spurling, R. G., 80, 498, 584.  
 Starr, S. H., 557.  
 Stern, M. J., 27, 98, 301, 359.  
 Stacy, C. B., 83.  
 Stevens, E. A., 145.  
 Stites, J. R., 110, 337, 375, 606.  
 Stites, F. M., 144.  
 Strickler, F. P., 134, 232, 280, 293, 369.

## T.

Taylor, J. Q., 616.  
 Teague, R. E., 235.  
 Thomas, Carleton, 13.  
 Thompson, Malcolm, 49, 487.  
 Toll, J. L., 149.  
 Townes, C. D., 37, 142.  
 Townsend, J. M., 707.  
 Troutman, W. B., 136, 194.  
 Turner, P. A., 174.  
 Tyler, W. L., 151.

## V.

Van Meter, J. F., 249.  
 Vaughan, Benj., 285.  
 Victor, K. N., 445, 504.

## W.

Wathen, J. R., 207, 283, 382, 159, 463.  
 Watkins, S. S., 503.  
 Weeter, H. M., 97, 290, 488.  
 Weiss, W. M., 224, 610.  
 Wells, G. M., 453.  
 Weston, W. G., 270.  
 White, L. A. J., 260.  
 Willmott, C. B., 72, 518.  
 Williams, J. D., 35, 64, 67, 90, 428, 438.  
 Willmoth, A. D., 232.  
 Winter, J. E., 204.  
 Wolfe, C. T., 28, 36, 89, 427, 443, 621.  
 Wyatt, W. S., 79.

## Y.

Yates, E. C., 429, 439, 440.  
 Young, W. J., 278, 711.  
 Youmans, C. E., 99, 301.

## Z.

Zimmerman, B. F., 373, 382, 395, 487, 502, 613, 623.



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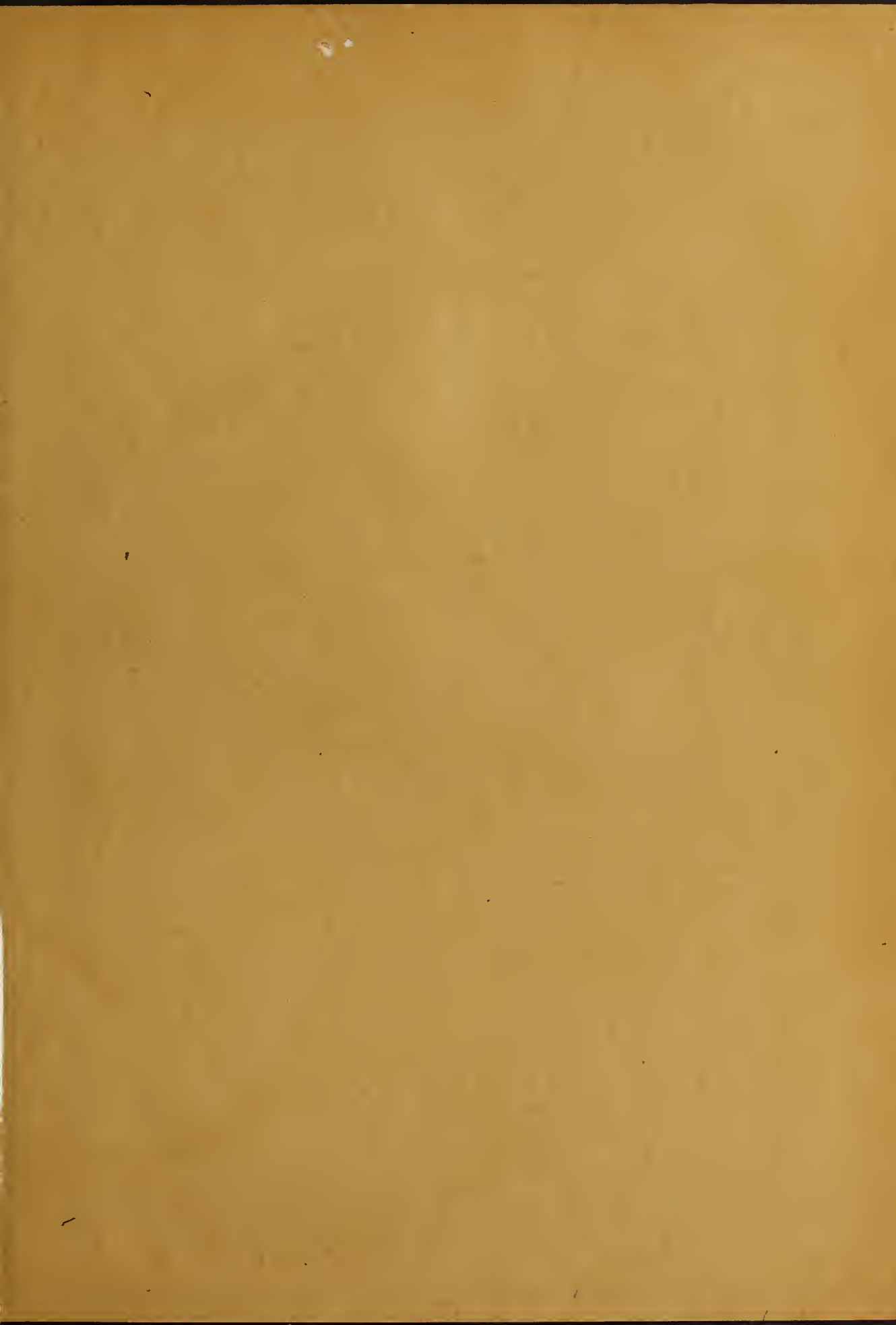
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